THE BOSTON
Medical and Surgical
JOURNAL

Owned and Published by the MASSACHUSETTS MEDICAL SOCIETY

OFFICIAL ORGAN OF THE NEW ENGLAND SURGICAL SOCIETY, THE BOSTON SURGICAL SOCIETY, INC., THE NEW ENGLAND PEDIATRIC SOCIETY, AND THE NEW HAMPSHIRE SURGICAL CLUB

Volume 194, Number 25 | $6 per Annum, 25c per Copy | JUNE 24, 1926 | Published Weekly in Boston at 126 Massachusetts Avenue

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VOLUME 194 JUNE 24, 1926 NUMBER 25

ORIGINAL ARTICLES

ON DIABETIC GANGRENE, WITH PARTICULAR REFERENCE TO THE VALUE OF INSULIN IN ITS TREATMENT*

BY HARRY BLOTNER, M.D., AND REGINALD FITZ, M.D.

INTRODUCTION

THE Peter Bent Brigham Hospital opened in the spring of 1913 and up to October 1st, 1925, had admitted 969 cases of diabetes. Of these, 69 or 7% had gangrene. In 1926 approximately 16,000 diabetic individuals will die in the United States, and of these, at a conservative estimate† between five and ten per cent will have gangrene. Next to coma as a preventable cause of death in diabetes stands gangrene. With gangrene so frequent, so often a preventable complication of diabetes and yet so common a cause of diabetic fatalities, we have considered it of interest to report the Peter Bent Brigham Hospital's experience with the disease and to comment on the value of insulin in its treatment.

THE MEDICAL HISTORY OF DIABETIC GANGRENE

Although diabetes has been recognized as a clinical entity for centuries, it is interesting to realize that the co-incidence of gangrene and diabetes was first pointed out so recently as 1852 by the French observer Marchal[17] (de Calvé). A brief literal translation of the essentials of Marchal's original paper on the subject reads as follows: "I have just observed an extraordinary phenomenon in the case of a diabetic patient which I hasten to describe. . . . Several days ago I was called to see a man affected with a spontaneous gangrene of the little toe. . . . I attempted to determine on what constitutional disturbance or diathesis the mortification might depend. . . . I discovered by chance through a maid-servant present at one of my visits, that the patient was exceedingly thirsty. . . . The circumstance was so striking that I immediately inquired into the quantity of urine rendered by the patient. It agreed with the fluid ingested. Two large vessels were filled each night and the patient's sleep was interrupted several times by the need of micturition. At this story, I could scarcely doubt the existence of glycosuria and . . . I sent a sufficient quantity of the urine to M. Mialhe for analysis, who reported that the liquid contained 90 gm. of glucose per liter. . . . I shall report on the result of treatment in this case later. Today I merely wish to call attention to the possible, if not probable, inter-relationship between certain cases of so-called spontaneous gangrene, of which the etiology is so obscure, and glycosuria. If the relationship is definite, how does the glycosuria produce necrosis? Is it by saturation of the living tissue in a saccharine solution? . . . I confine myself to asking these questions and shall discuss them again, only when more convincing evidence on the matter is accumulated."

In tracing the development of our knowledge of diabetic gangrene from Marchal's time down to the present, the names and work of several investigators stand out pre-eminently. Roser[26], in 1880, introduced the problem of diabetic gangrene to German physicians, noting that since Marchal's original paper, various French articles had appeared on the subject but that the importance of the complication had been so far generally overlooked. Israel[12], in 1882, made the first pathological study of diabetic gangrene. He recognized the importance of vascular disease in all diabetics, even the youngest, and established the fact that the vast majority of cases of diabetic gangrene are due to an underlying arteriosclerosis. His observations were confirmed by Heidenhain[11] in 1891 and by Buerger[5] in 1915. The discovery of the Roentgen ray in 1895 and its almost immediate, manifold, clinical applications, led Bengoch[2], in 1905, to study the arteries of patients with diabetic gangrene roentgenologically and thus to visualize the sclerosed vessels in certain cases. Subsequently this method as an aid to diagnosis and treatment has come into fairly general use.

During the last ten years there has been a steady progress in the treatment of diabetic gangrene. This has come, in part, from a closer co-operation between surgeon and internist in the management of such cases, in part, through

*From the Medical Clinic of the Peter Bent Brigham Hospital, Boston.

†As a basis for this estimate, the Public Health Reports[21] show that 17,000 people died from diabetes in the death registration area of the United States in 1922, 17,357 in 1923, and 16,453 in 1924. Morrison[20] found that among 1775 reported diabetic deaths in Boston from 1895 to 1913, there were 178 cases of gangrene.

improved methods of diabetic treatment and surgery, in part, through improved laboratory methods for gauging the severity of cases from the chemical or bacteriological standpoint, in part, through a better understanding of the fundamental pathological physiology of diabetes, and, in part, through the discovery of insulin. Nevertheless, despite these advances in our knowledge of diabetic therapy, gangrene remains one of the most formidable complications of diabetes and deserves most serious consideration.

THE AGE OF PATIENTS WITH DIABETIC GANGRENE AND THE DURATION OF DIABETES PRIOR TO THE DEVELOPMENT OF GANGRENE

As various observers have already noticed, gangrene is usually a complication of diabetes in old people. This fact is illustrated by a tabulation of the age of our patients at the time of the onset of gangrene.

TABLE 1

THE AGE OF ONSET OF DIABETIC GANGRENE IN 69 CASES

Number of cases	Age at time of onset of gangrene
1	32
3	36-47
25	50-60
29	60-70
11	70-77

As can be seen, all but four cases (6%) occurred in individuals over fifty. Since elderly people with diabetes usually have mild diabetes, the fact that gangrene often complicates long-standing cases is not remarkable. Of 63 cases in this series, able to date the onset of diabetes with any accuracy, one half were known diabetics of more than five years' standing and fourteen had been afflicted with the disease for periods of from eight to forty-five years. Apparently no diabetic need be too well seasoned, and no case too mild to avoid gangrene.

According to the classical descriptions of diabetic gangrene, it is more common in men than in women, it usually originates in a leg, and it less frequently develops in an arm or elsewhere. In our cases, there were thirty-eight men and thirty-one women; the lower extremity was affected in sixty-five cases, and the arm in four cases. Sturgis'[28] case of gangrene of the lip in a diabetic is worth referring to, as are also Bowers'[4] cases of gangrene of the nose, occurring in three juvenile diabetics, Connell's[8] adult case, Morris'[19] case of gangrene of the middle turbinate bone in a diabetic woman fifty-eight years old, Raymond's[25]* and Pilot's[22]* diabetic cases of gangrene of the lung, and Chauffard's[6] case of gangrene of the penis and scrotum in a young diabetic man. These cases tend to show that while gangrene ordinarily develops in the leg of diabetic individuals and in elderly patients, yet it may affect almost any part or region, and persons of any age.

*Strictly speaking, these are not necessarily cases of diabetic gangrene but rather of pulmonary gangrene happening to occur in diabetic individuals.

THE PATHOLOGY OF DIABETIC GANGRENE

Buerger[5] has written the only recent comprehensive American paper on the pathology of diabetic gangrene. He believes that the essential lesion is not a gangrenous process peculiar to diabetes but one usually dependent upon arteriosclerosis. The arteries characteristically show extensive degeneration in their walls, calcification, often occlusion of a large part of a vessel's course and sometimes a combination of intense arteriosclerosis and thrombosis. A second fairly common type is due to an occlusive thrombosis superimposed upon mild or moderate arteriosclerosis. Finally, he says, gangrene may occur in cases in which the vessels are absolutely normal; in such cases the gangrene is due to embolism and thrombosis. This type is not uncommon as a complication or sequela of certain infectious diseases.

Labbé[14] has lately voiced the views of certain French observers, and considers that in addition to the arteriosclerotic and infectious gangrene of diabetes, recognized by Buerger, there is also a true diabetic gangrene of nervous origin occurring in patients with a normal arterial supply to the affected part. In these cases, the reflexes of the limb are usually diminished or absent, there may be no marked arterial disease, the blood supply as estimated by oscillometry may be normal and the gangrene is superimposed upon a trophic ulcer.

So far as the Brigham Hospital experience goes, our cases fall in with Buerger's views. In all cases in which careful pathological studies of a gangrenous limb were carried out, vascular disease was present as the fundamental lesion with superimposed thrombosis, infection or bony necrosis. We find no evidence for thinking that the lesion of diabetic gangrene is in any way specific nor that it differs from senile or arteriosclerotic gangrene in non-diabetic individuals.

THE CAUSE OF DIABETIC GANGRENE

Admitting that the pathology of diabetic gangrene is due to arteriosclerosis in the majority of instances, it is interesting to speculate on the underlying cause of the vascular disease. Joslin[13] found in his cases that a positive Wassermann reaction, or history of syphilis, was about seven times as common among his patients having gangrene as among 1000 cases of diabetes or among 300 diabetics over fifty years of age. He therefore feels that each case of gangrene should be studied with especial care for signs of syphilis. Pinard[23] also believes that many of the complications of diabetes, such as perforating ulcer or neuritis, are manifestations of syphilis. Our evidence is contradictory

to this belief. Wassermann tests were performed in fifty-two cases and all were negative. Only three patients had a positive syphilitic history and in three others the roentgenological findings in the long bones were consistent with a luetic periostitis. In none of these patients were there any clinical manifestations of syphilis. On the whole, we have been unable to convince ourselves that syphilis played an important rôle in the causation of gangrene in any of the cases of this series.

Letulle[16], Labbé and Heitz offer an engaging hypothesis as to a possible bio-chemical cause of diabetic arteriosclerosis. They suggest that as the result of long-continued hypercholesterolemia, cholesterol may be retained in the intima of the arteries and thus promote calcification and obliteration of the vessels. Possibly Gray's[10] observations on the prognostic significance of the blood cholesterol concentration in diabetes and Warren and Root's[30] recent pathological studies are confirmatory of this idea. Gray showed in a series of cases that the higher the percentage of cholesterol in the blood, the more unfavorable was the prognosis, while Warren and Root concluded that the vascular disease so evident in many of their cases was more closely related to the duration of the disease than to the patient's age at the time of the onset of the illness. One might use such studies as indirect evidence in support of the hypothesis of Letulle, Labbé and Heitz and agree with them in the assumption that long-continued diabetes, hypercholesterolemia and vascular disease go hand in hand. Further studies along these lines are desirable.

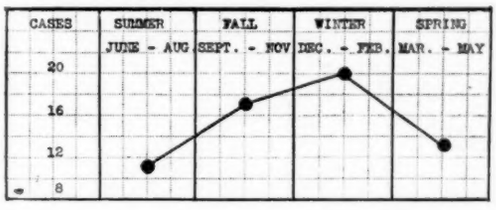
The possible effect of long-continued hyperglycemia upon arteries, or 'the effect of saturation of the living tissue in a saccharine solution,' as Marchal expressed it, is also worth considering. Our evidence on this point is not at all convincing. Blood sugar determinations were made in all cases shortly after entry to the Hospital and ranged from .11% to .96%. The majority of the blood sugar values were below .30%, and very high readings were uncommon. Since there was no way of determining for how long a time previous to the development of gangrene, hyperglycemia had existed, the figures are of little value. Until clear-cut evidence is obtained upon the relation in diabetes between hyperglycemia, glycosuria and vascular disease, Marchal's original query on this point must remain unanswered.

On the whole, it is fair to say that the fundamental cause of the diabetic's tendency to develop arteriosclerosis is entirely a matter of speculation at present. On the other hand, the immediate precipitating cause of diabetic gangrene is often easily defined. Trauma of some sort with superimposed infection brought on the gangrene in 65% of our cases. In going through the case histories one is impressed by the number of patients who developed gangrene following very minor trauma such as cutting corns too closely, or paring toe-nails, or neglecting blisters caused by wearing new and too tight shoes.

Another possible and interesting etiological factor in the causation of diabetic gangrene is the state of the weather. In Minnesota, Beard[1] has noted that 95% of the diabetic gangrene cases appearing at the University Hospital in Minneapolis entered during the winter months, an observation which led him to assume that cold must be a considerable factor in the precipitation of the disease. Our cases bear out this opinion to a certain extent. We were able to obtain a fairly good account of the onset of acute symptoms in sixty-one cases and have charted their time of onset in seasons. The result of this study is shown in Table 2.

TABLE 2

THE FACTOR OF WEATHER AS A CAUSE OF DIABETIC GANGRENE IN 61 CASES



As can be seen, our cases also showed a tendency to develop gangrene with greater frequency in the colder months of the year than during the warmer months, though our experience is by no means as striking as that of Beard. As corroborative evidence on the importance of cold in producing diabetic gangrene, McLester[18] states that it is an extremely rare complication in his wide experience among diabetic patients in Alabama, and Paullin[21a] has seen it in only fifteen instances among 560 diabetic cases in Atlanta, Georgia.

It is worth emphasizing, that all cases of diabetic gangrene do not develop as the direct result of trauma nor in cold weather, and that many seem to have a spontaneous mode of onset the cause of which is difficult to assign. Two of our cases are very striking in this respect. One woman came in to the Hospital with a gangrenous leg which was immediately amputated. During her period of convalescence from the operation, at about the time she was beginning to get out of bed and to feel well, when the blood sugar had been normal for several weeks, and the urine had been sugar-free, and at a time when she was under most careful supervision, she developed an area of gangrene on the heel of the remaining leg which gradually spread and finally required amputation. The second case was very similar,—a patient entered the Hospital for diabetic treatment with apparently normal legs, and while under observation developed an area of gangrene in one foot which spread rapidly and finally demanded amputation. These two

cases suggest that too much rest and inactivity may be almost as dangerous for the elderly arteriosclerotic diabetic as cold and trauma,—indolence may be an important factor in the production of a small thrombosis in a sclerotic vessel and may thus lead to gangrene.

THE CAUSE OF DEATH IN DIABETIC GANGRENE

Sixteen of our sixty-nine cases, or twenty-three per cent of the series, died while under observation in the Hospital. These figures demonstrate in a striking way the possible severity of diabetic gangrene. It now has a far higher hospital death-rate than diabetic coma. It is always an alarming condition and demands the most skilled attention.

The common causes of death in our cases were infection, post-operative shock or some sudden unpredictable cardiovascular accident. Nine patients died of infection, three, before the days of insulin, being in diabetic coma, one of shock, five of pulmonary embolism and one of spontaneous rupture of the spleen. Infection appeared to be the most important single factor in causing death. Occasionally it developed as a fulminating streptococcus septicemia from a lesion that appeared fairly innocent. To show how varied a type of infection may be encountered in these cases, however, it is worth mentioning that there were two cases of gas bacillus infection and three of bronchopneumonia; Walter's[29] diabetic case of tetanus developing on a gangrenous leg must also be remembered; and likewise Olmsted's[21] description of the peculiar toxemia sometimes encountered, accompanied by progressive anemia and marked prostration, perhaps due to the absorption of toxines from autolysed gangrenous tissue.

THE TREATMENT OF DIABETIC GANGRENE AND HOW IT HAS BEEN INFLUENCED BY INSULIN

The treatment of diabetic gangrene is of three types,—prophylactic, medical or surgical. Joslin[13] is an ardent preacher for the prevention of diabetic gangrene by simple common-sense methods. As he says, if the diabetic kept his feet as clean as his face, gangrene would seldom occur. He advocates that each patient be warned of the danger of gangrene, be systematically taught how to care for his feet and how to avoid the minor forms of trauma which have so frequently induced gangrene. He describes simple daily exercises for the arteriosclerotic patient which tend to maintain his circulation through the feet and toes to best advantage. On the whole, he considers the prophylactic treatment of gangrene highly important.

The medical treatment of diabetic gangrene consists in making and keeping the patient's blood sugar concentration and urine normal, and at the same time treating the gangrenous part by heat, massage or some other form of physiotherapy in the hope that such measures may induce a considerable return of circulation to the involved area. Lambert[15] and Foster were among the earliest to advocate such conservative treatment of gangrene, and Bernheim[3] more recently has written an excellent paper on the same subject.

Already cases like Du Pré's[9] are being reported in which insulin has been used to advantage in treatment. Du Pré's case was that of a man of seventy-three with moist gangrene extending from the base of the little toe to the heel along the outer border and dorsum of one foot. In one area, the bone was becoming visible and the subjacent tendons were lying free and eroded in an open ulcer. In the course of time, under prolonged insulin and diet therapy, there was complete healing.

Finally, in France, Cluzet[7] and Chevallier have used diathermy in the treatment of diabetic gangrene claiming thus to have saved, in certain instances, the necessity for amputation, and Seriger[27], in Germany, has used with equal enthusiasm and good effect, foreign protein injections believing that dilatation of the peripheral vessels and healing of the gangrene was obtained thereby.

The surgical treatment of diabetic gangrene consists in ablation of the gangrenous part, or in drainage of infected areas. It is not within the scope of this paper to outline the various surgical procedures which are used nor to discuss choice of anesthetics, methods of preparing patients for operation, etc. Suffice it to say that we have had no experience with the uses of diathermy or foreign protein injections in the Brigham Hospital but have followed ordinary medical or surgical procedures in the management of our cases.

Thirteen cases* were treated medically without insulin. Of these, three cases died. Forty cases were treated surgically without insulin. Of these, ten cases died. Eleven cases were treated medically and with insulin. Of these, two cases died. Nine cases were treated surgically and with insulin. Of these, one case died. Combining the cases treated with and without insulin, it appears that in fifty-three cases of diabetic gangrene treated without insulin, thirteen or 30% died while of twenty cases of diabetic gangrene treated with insulin, three or 15% died. These figures suggest that the gangrene cases selected as requiring the use of insulin fared appreciably better than did those cases in which the use of insulin did not seem necessary or for which the drug was not available. That the process of selection of the cases has had but little to do with the diminished mortality-rate is suggested by the fact that there were ten deaths among forty cases of diabetic gangrene treated by any method, previous to October 1922, (25% mortality) and

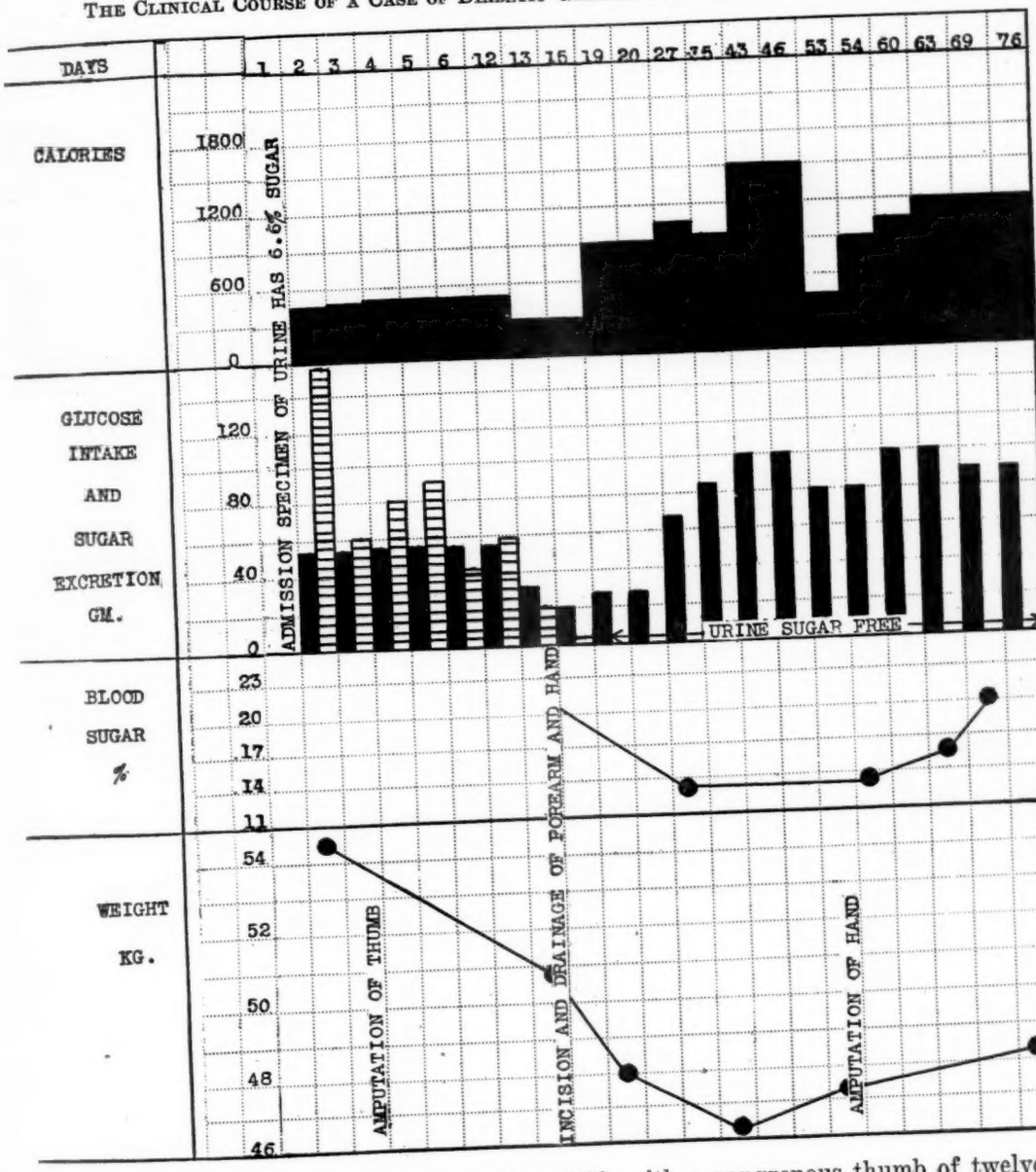
*In this tabulation we have included as separate cases those patients who entered the Hospital on more than one occasion for repeated attacks of gangrene.

six deaths among thirty-three patients (18% mortality) since insulin has been in general use. The surgical or medical procedures utilized, the methods of anesthesia adopted and the character of the cases entering the Hospital have changed so little in the last twelve years that the dietetic management of the surgical cases and has thus indirectly had a profound influence upon the surgical problems involved.

Table 3 illustrates graphically the treatment of a man of fifty-six with diabetes of five years' duration who entered the Hospital in April

TABLE 3

THE CLINICAL COURSE OF A CASE OF DIABETIC GANGRENE TREATED WITHOUT INSULIN



it seems difficult to escape the conclusion that insulin has already had, in our experience, an appreciable effect upon lowering the immediate mortality-rate of our gangrenous cases.

In going over the material at our disposal we have not been particularly struck by the effect of insulin upon the healing of gangrene once it has developed. Except for a few cases of superficial gangrene, there have been few which have healed spontaneously under medical care alone. Insulin has, however, completely changed

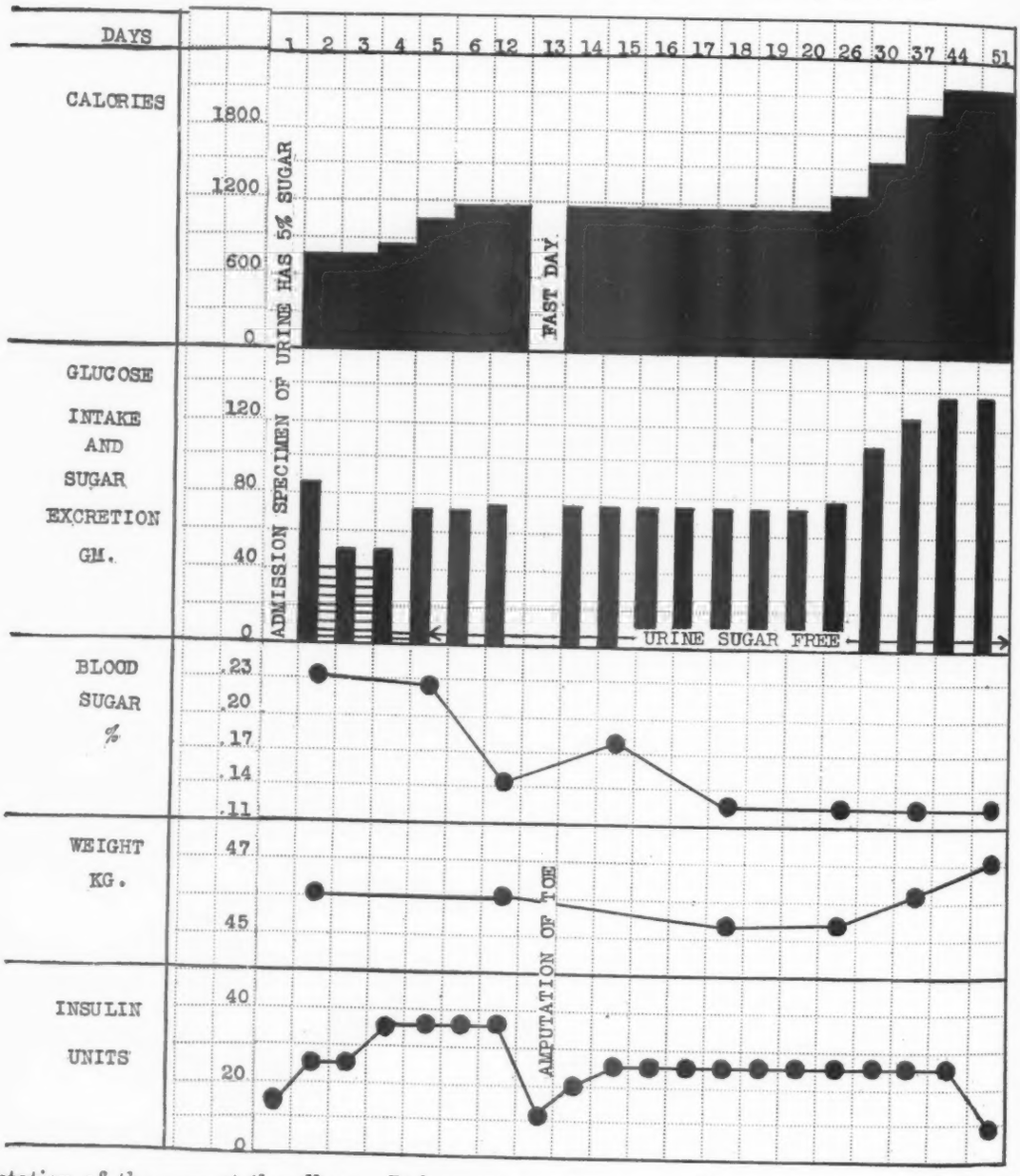
1922, with a gangrenous thumb of twelve days' duration, the result of an automobile accident. During the seventy-six days in the Hospital the patient never received more than 1500 calories of food on any one day nor was the total glucose of his diet more than 100 grams. The urine did not become sugar-free until after the fifteenth day. While it was possible to bring the fasting blood sugar level to within normal limits through prolonged undernourishment, yet the blood sugar level rose as soon as any

increased food was ingested. As a result of such long-continued undernourishment there was a rapid loss of weight and strength, and n increase of resistance to infection. Thus the amputation of the gangrenous thumb was followed by infection of the forearm and final

with insulin. As can be seen, there was no prolonged period of malnutrition; the urine was made sugar-free and the blood sugar was brought rapidly to normal. Shortly after operation, the diet was pushed up so as to insure the patient an adequate amount of food during

TABLE 4

THE CLINICAL COURSE OF A CASE OF DIABETIC GANGRENE TREATED WITH INSULIN



amputation of the arm at the elbow. It is easy to imagine that a general infection might have developed at almost any time during the illness and that it might have spread with great rapidity through such an unresisting host.

Table 4 illustrates the treatment in a woman of fifty-three with diabetes of five years' duration who developed a gangrenous toe as the result of some minor injury, and who was treated

convalescence. There was no loss of weight or strength. The wound healed rapidly and cleanly, and as the infection cleared up, the patient's natural tolerance increased so that the dosage of insulin was cut down.

The contrast in the treatment of these two cases is fairly typical of our experience. In brief, insulin has afforded a means for rapidly desugarizing patients before operation and for

allowing a liberal diet during convalescence from operation. As a result, the patients have gone through their various operations well and have been discharged from the Hospital sooner and in a more satisfactory condition than previously. We have met with certain failures,—notably in cases with a spreading infection and septicemia which had developed before insulin was given. A few others have come to grief through some complication of vascular disease entirely independent of diabetes. On the whole, however, in our experience, insulin has been almost as valuable in the treatment of diabetic gangrene as it has been in the treatment of diabetic coma.

THE END RESULT OF DIABETIC GANGRENE

In conclusion, a word should be said about end-results in the treatment of diabetic gangrene. Of the sixty-nine patients in this series, sixteen died in the Hospital and fifty-three were discharged more or less improved. We have been able to follow up forty-two of the discharged cases and know that of them, twelve are dead, five dying within a year and a half of their discharge from the Hospital and the rest at intervals up to eight years from their time of discharge from the Hospital.

The thirty patients who are still alive are all getting along satisfactorily and find life worth living. Therefore the successfully treated case obtains so good an end-result from the view points of physical comfort and prolongation of life as to more than justify the hazards and discomforts of even most radical treatment during the acute attack of gangrene. As a commentary upon the difficulties of the problems which must be solved in treating diabetic gangrene, however, it is interesting to note that of the original sixty-nine cases, eleven had been treated for a previous attack of gangrene before coming to the Brigham Hospital, and that six of the forty-two "followed-up" cases developed a fresh and fatal attack of gangrene after leaving the Hospital. Thus one attack of gangrene is likely to be followed by other attacks, and no matter how carefully patients are trained in the prevention of gangrene and in methods of diabetic treatment, the liability to gangrene is a constant menace for all elderly diabetic patients.

SUMMARY AND CONCLUSIONS

This paper reports a clinical study of diabetic gangrene based upon sixty-nine cases observed at the Peter Bent Brigham Hospital. In our experience, gangrene has been a relatively frequent complication of diabetes, occurring in 7% of all diabetic cases admitted to the Hospital.

Gangrene usually depends upon obliterative vascular lesions in the extremities of elderly diabetic patients, with superimposed infection, thrombosis or osteomyelitis. It may, however, occur in young people with essentially normal blood vessels and be of infectious origin. It is likely to recur so that one attack does not prevent subsequent attacks.

The underlying cause of the vascular disease encountered in the majority of cases of diabetic gangrene is unknown. Syphilis was of but little importance as an etiological factor in our cases and the relation of the bio-chemical changes encountered in diabetes to the development of arteriosclerosis was a matter of speculation.

Trauma, often of a very minor nature, was the immediate cause of the gangrene in sixty-five per cent of our cases. More cases originated during the winter than during the summer months. Two patients developed gangrene while at rest and under observation in the Hospital. Minor injuries, cold weather and lack of exercise, therefore, all seemed important factors in the precipitation of gangrene.

Diabetic gangrene has a notably high death-rate. Twenty-three per cent of the cases in this series died while under treatment in the Hospital. The most important immediate cause of death was infection, at times developing as an overwhelming general infection from a small local lesion. Other less important causes of death were shock, or unavoidable vascular accidents.

Gangrene is often a preventable complication of diabetes. The avoidance of dirt, of minor injuries, of cold hands and feet and of too sedentary a life are important prophylactic measures against gangrene.

The treatment of gangrene consists in the employment of medical or surgical measures. Our experience with the medical treatment of gangrene has not been noteworthy. A few cases with very superficial and small areas of gangrene have cleared up under the combination of diet, rest and various forms of physiotherapy. On the whole, however, our results with the medical treatment of gangrene have been disappointing.

We have been particularly interested in the effect of insulin upon the surgical treatment of diabetic gangrene. Up to October 1922, when insulin was first used in the Hospital, 25% of the gangrenous cases treated by any method died, while since that date 18% of the gangrenous cases have died. Insulin, therefore, appears to have had an appreciable effect in lowering the Hospital's mortality-rate of these cases.

In comparing cases of diabetic gangrene treated surgically with and without insulin, it appears that insulin has afforded a means for rapidly desugarizing patients before operation and for allowing them a liberal diet during the period of convalescence from operation. Before the days of insulin we saw certain patients who died in coma: certain others were forced to undergo prolonged periods of malnutrition in preparation for operation and during convalescence therefrom, and suffered progressive

loss of weight and strength, became unresistant to infection, finally required repeated operations and even died after a protracted illness. With insulin we see patients made free of acidosis and prepared for operation in a few hours and able to eat an adequate diet shortly after operation as a result of which they gain weight and strength, resist infection and recover from their illness in a rapid and gratifying fashion.

The Hospital's death-rate from diabetic gangrene is considerably higher than the present death-rate from diabetic coma. The proper use of insulin in the treatment of diabetic gangrene is as important as is the proper use of insulin in the treatment of diabetic coma. All cases of diabetic gangrene should be treated as carefully and as energetically as cases of diabetic coma are treated.

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INSULIN IN INFANT FEEDING

BY HYMAN GREEN, M.D., AND GEORGE ROBBINS, M.D.

THE use of insulin in the treatment of non-diabetic conditions is yet in the experimental stage and its first use in relation to the treatment of malnourished infants was first suggested by Pitfield in 1923[1]. He was impressed with the stimulating properties of this active principle of the Islands of Langerhans and he tried injecting one unit of insulin daily for 3 weeks into two young infants. The injection was given at the same time as the morning feeding. He considered that beneficial effects were obtained in both cases.

In the study of food requirements of malnourished infants[2] it has been shown that the basal metabolism, i. e., the heat output is greater in malnourished infants than in the normal infant. Furthermore the malnourished infant needs more material for growth if normal development is to be attained. It is usually stated that a normal infant of average weight requires a daily intake of food having a fuel value of approximately 45-50 C. per pound of body weight or 100-110 per kilo, and that the supply of whole milk needed to supply the necessary protein and mineral salts approximates 1½ oz. per pound of body weight daily. In the case of an undernourished infant weighing one-half of what he should weigh the total food requirements is likely to be in the neighborhood of 100 calories per pound or 220 per kilo and the milk requirements somewhere in the neighborhood of 3 ounces per pound of body weight. Of course, these are the optimal requirements. A malnourished infant may gain slowly on less but entirely satisfactory results are not often obtained unless the amounts of food indicated are given. Most often it is found that it is quite impossible to give these infants the optimal quantity of food as they are unable to handle it. Some infants fail to gain even when these nutritional requirements mentioned above have been met, and, in these infants it is necessary to resort to other means to increase the capacity for utilizing food. Marriott is strong in the indorsement of repeated blood transfusions of matched citrated blood. The amount he uses is 1 ounce of blood for each 3 pounds of body weight or 20 cc. per kilo. He also utilized the

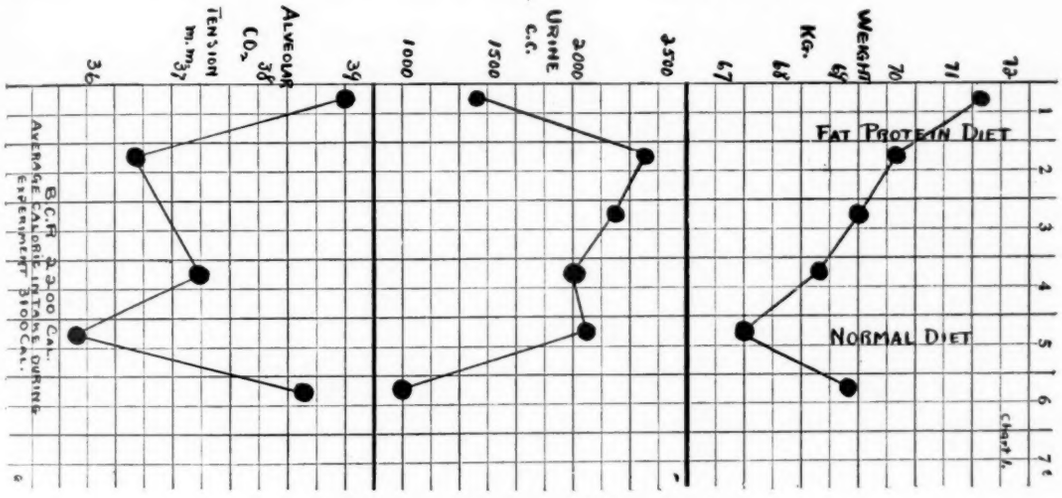
procedure of glucose and insulin administration. This procedure as outlined by him was the daily intravenous injection of from 9.5 to 14.2 cc. per pound of body weight of a 20% solution containing 15 units of insulin per 20 grams of carbohydrate. In the two cases reported in detail by him, the daily injections were given for a period of 10 to 18 days respectively.

From these cases Marriott concluded that the nutrition of malnourished infants might be rapidly improved by intravenous injections of glucose and insulin. As a result of Marriott's work Barbour[3] presented a series of forty cases in which he administered insulin to 40 non-diabetic malnourished children.

His methods of administration and dosage are as follows. In all cases insulin was given subcutaneously. All children under 2 years of age 3 units of insulin t.i.d. 20 minutes before meals. To all of 2 years of over 5 units t.i.d. Barbour believes that the maximum benefits are received when insulin is pushed to the limits of the individual's capacity. When that point has been reached the patient shows it one or more of the following ways. A sudden rise of temperature, loss of appetite, nausea, vomiting and weakness. Of the 40 cases treated 38 were benefited, 23 of the children had accompanying infections which were also improved. Then came the work of Tisdall[4] and his co-workers who very carefully checked the work of the above mentioned investigators. They first studied the effect of intravenous glucose and insulin giving 10 cc. per pound of body weight of a 20% solution of glucose with 15 units of insulin per 20 grams of carbohydrate. In a series of nine cases only one made any gain of note.

The effect of the subcutaneous administration of 10 cc. per pound of body weight of a 15% solution of glucose twice a day and the subcutaneous administration of insulin at different periods before the injection of glucose was studied in seven infants. No local or general ill effects from the subcutaneous injection of 15% glucose was observed in any case. In those infants that did gain there was a similar rate of gain previous to administration of insulin so that these were not suitable for study.

The effect of insulin administered subcutaneously before each feeding was studied in six cases. Four gained very satisfactorily, one slightly and the other did not increase. In this series some of the cases were also not entirely suitable but in general these did better than in the other two groups.



Dehydrating effect of a carbohydrate free diet.

Insulin will produce its greatest effect on the diminution in the rise in blood sugar when given from one to one and a half hours before the injection of the sugar.

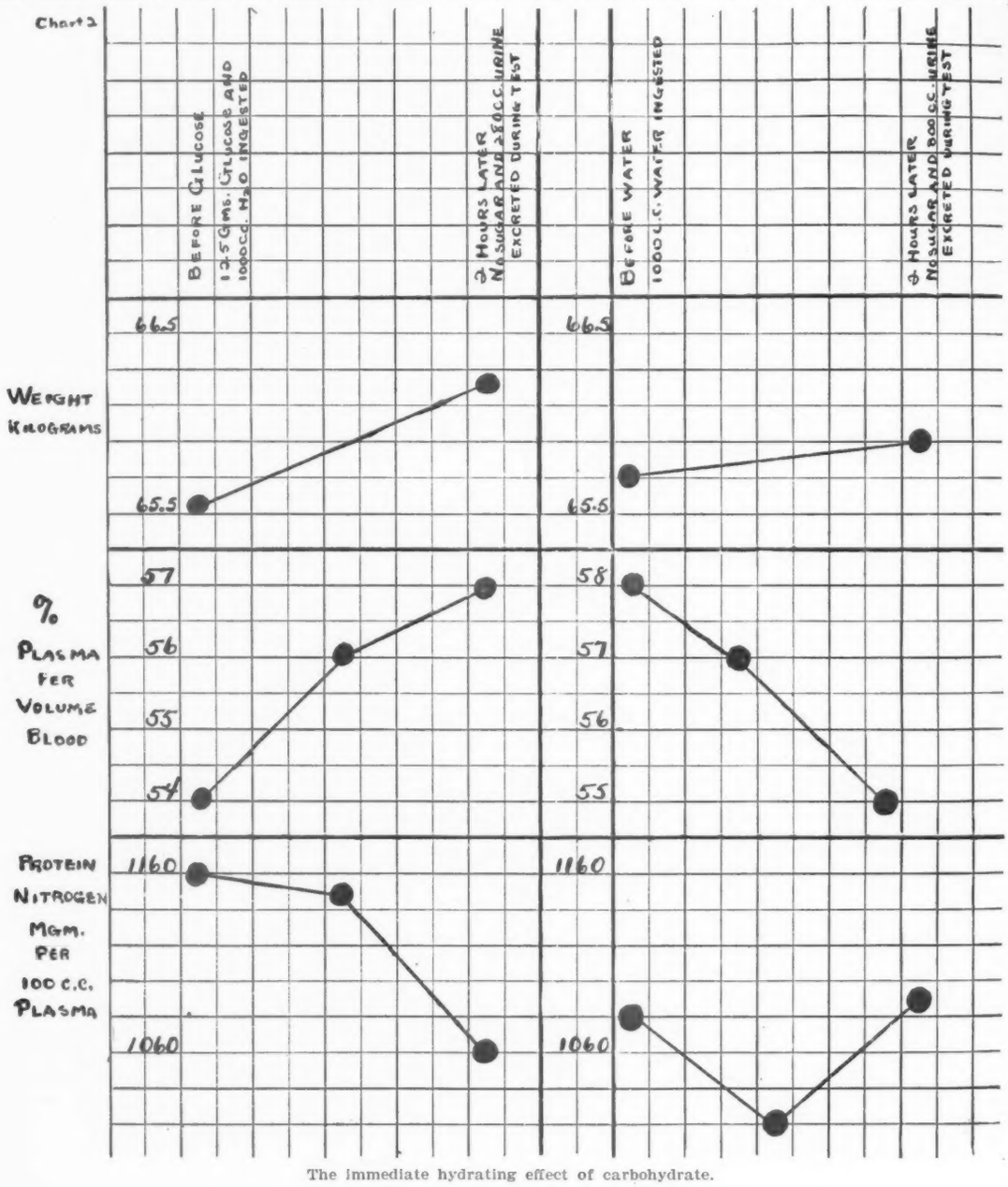
It might be well to show briefly the effect of carbohydrates on the water balance and on the body weight. We are indebted to Dr. Reginald Fitz for this information and his charts illustrating this point. In Chart 1 is seen the effect of a fat-protein diet averaging 3100 calories during the experiment which was much over the basal metabolic rate and yet there was progressive loss of weight. The urinary output increased and there was a diminution of alveolar CO_2 tension. Simultaneously the weight increased, the urinary output diminished and the CO_2 tension approached normal. In other words the absence of sugar caused dehydration.

Chart 2 illustrates the immediate effect of sugar as a means of hydrating the tissues. One hundred twenty-five grams of gleucose and 1000 cc. water ingested and at the end of 2 hours we note that there is a very definite increase in weight, an increase in the per cent of plasma per volume of blood, and the protein nitrogen becomes lessened. There is only 280 cc. of urine excreted during this period so that there is retention of fluid diluting the blood and thereby its elements. On the same chart is seen the same test repeated using only 1000 cc. of water.

There is an increase of weight comparable to the slight amount of fluid retained at the end of the 2 hour period but we see the opposite effect on the volume of blood plasma and a slight increase in protein ingrogen.

The next chart, Chart 3, showing the effect of insulin on the water metabolism serves as a comparison to Chart 1 where a diet high in calories was given while in this instance only 1500 calories or the estimated basal caloric requirements was given and we note the following: A marked increase in per cent plasma per volume of blood, the protein nitrogen is diminished, the weight is increased markedly, and a diminished urinary output over the intake. The amount of insulin used is indicated on the chart. In other words the blood becomes dilute, there is an oliguria and accompanying this dilution there is a forcing of the rate of oxidation and storage of sugar, resulting in storage of water. This accounts for the gain in weight.

In a small way in order to bear out this dilution phenomenon caused by insulin and carbohydrate we have taken the hemoglobin and red cell count before and after insulin. In all cases there was a very definite fall in per cent hemoglobin by Sahli method and a diminution in RBC.



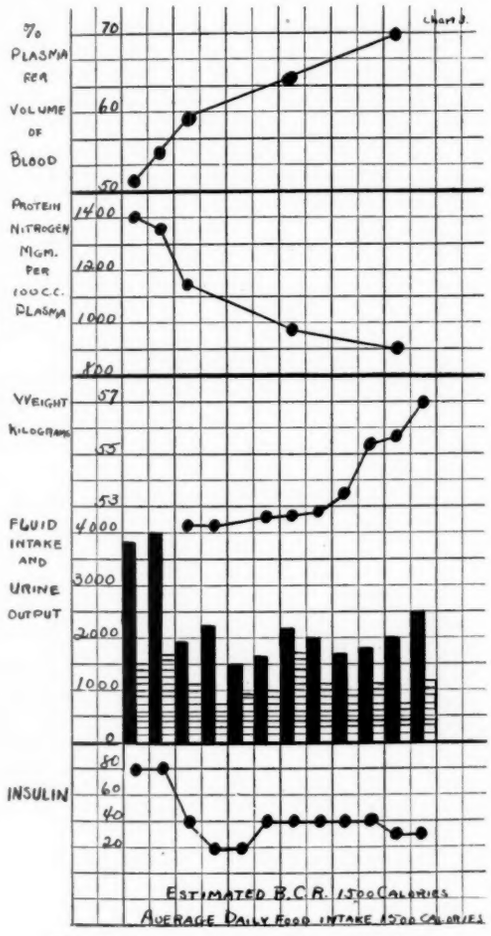
The immediate hydrating effect of carbohydrate.

It might be asked what brings about this dilution, and what is its mechanism? The answer lies in the work of J. B. Haldane, Kay & Smith[5] published in the *London J. of Physiology* in which they say:

"The administration of insulin to normal

rabbits leads to an appreciable rise in the blood volume as indicated by a fall in the hemoglobin value and corpuscular count. The hypothesis is, that insulin brings about blood dilution by rendering the kidney temporarily impermeable to liquid while absorption of liquid from the intestinal tract is still going on at the normal rate."

Further study of the actions of insulin by J. H. Burn and H. H. Dale[6] shows that when more dextrose disappears than the CO_2 pro-



The effect of insulin on water metabolism.

duced will account for, it is certain that all the dextrose has not been burnt but that some has been changed into some other form. It can be said with certainty, therefore, that some additional dextrose which disappears under insulin is not oxidized. To account for the disappearance under insulin of much more sugar than the oxidation accounts for, some further process is required. Bissinger, Tesser and Zipf postulate that when the supply is large in relation to insulin dosage a part of sugar is burnt and the energy so liberated used in the synthesis of a further quantity into glycogen. M. Ringer has also shown that insulin will cause both the combustion of dextrose and its storage, presumably as glycogen. Some have put forth the hypothesis that there is a concentration of metabolism on the carbohydrates and sparing of an equivalent of protein and fat.

Buttenwiesser[7] agrees that there is increase in weight but as to the nature of the mechanism he is not certain. It may be that under the influence of insulin there are changes in the water and salt both in the blood and tissues so that the retention may be extra-renal. He observes that there is not only an increase in weight but an improvement of the general condition in healthy and dystrophic children after the injection of 5 units of insulin b.i.d. This action was especially pronounced in children with liability of water metabolism. He distinguishes between infants who are hydrostabile and those who are hydrolabile. Infants whose weight is steady he calls hydrostabile and those whose weight fluctuates he calls hydrolabile. It is in this latter group that the effect of insulin is most marked.

Laufberger[8] believes that insulin blocks the formation of carbohydrates from other substances but not necessarily the formation of glycogen from glucose.

Its normal biologic significance is the inhibition of cleavage of other reserves of the organism after ingestion of carbohydrates. This inhibiting action on the new formation of carbohydrates is in his opinion the essence of its action. Thus it is evident that our experiment is not empirical but has a sound pharmacological basis.

Case 1. Frances C. Age 1 year. B. F. H. No. 4639.

Discharged as improved from the Onshore Department with a diagnosis of Rickets, Pyelitis and Regulation of Feeding. Re-admitted on 6-30-25 for Rickets and Regulation of Feeding. Physical examination revealed a poorly developed and poorly nourished child with well marked rickets and hydrocephalus. Prior to admission she had been gaining steadily but after entrance into the hospital the weight chart shows a downward trend with exception of one interval where there was a gain followed by further loss. In view of the fact that the loss of weight continued despite a diet sufficiently high in calories, we chose this case as one that might be amenable to insulin therapy. During the period of the administration of insulin she gained 240 grams. The gain, though small, is striking in view of the fact that during this period she was running a temperature of unknown origin, ranging from 100 to 102.5. (See Chart No. 1.)

Case 2. Edward H. Age 15 months. B. F. H. No. 4716.

Admitted because of failure to gain for past 6 months. Past history is negative. Mother died of Tuberculosis 1 year ago. Physical examination was essentially negative except for enlargement of the underweight and refusal to take food. There was a progressive loss in weight after admission. When the administration of insulin was instituted the child was below his entrance weight. He made a steady gain, a total of 400 grams in 14 days. This case we considered a very suitable one for study as the history states a failure to gain for past 6 months and a progressive loss after admission. (See Chart No. 2.)

CASE 3. Edward M. Age 16 months. B. F. H. No. 4722.

Admitted to the hospital with a complaint of underweight and refusal to take food There was a history of failure to gain in weight for past six months. Physical examination revealed no special evidence of disease other than malnourishment. This child has been on a 14 months house diet since admission. He made an initial gain of 60 grams followed by a progressive loss. In view of the fact that he was losing weight and receiving a diet sufficiently high in calories we decided to put him on insulin. When insulin was started, he was below his admission weight. Following the administration of insulin there was a steady gain in weight amounting to 380 grams in thirteen days or approximately an ounce a day. Another noteworthy thing in this case is the enormously increased appetite since the administration of the insulin. (See Chart No. 3.)

CASE 4. Eleanor V. Age 1 year. B. F. H. No. 4663.

Admitted from the On-Shore Department for Regulation of Feeding. A premature baby weighing 4 pounds at birth, otherwise history and physical examination are negative. After admission she persistently refused her feedings and there was a decided loss of weight. After one week, she gained a little but was still far below entrance weight. The feedings became more difficult and her weight remained stationary, throughout remainder of the month, at which time insulin was given, and her weight began increasing, resulting in a total gain of 300 grams in 13 days. This is another case in which the appetite improved markedly following the administration of insulin, so much so that her feeding can no longer be termed difficult.

CASE 5. Joseph M. Age 16 months. B. F. H. No. 4689.

C. C. Convalescing from a series of infections and malnutrition. P. E. was negative except for evidence of malnourishment. In this case also there was marked anorexia and it was necessary to force each feeding. Under such conditions it would be expected that he would lose weight as indicated on the chart. On the 24th day in the hospital, insulin was given and immediately improvement was noted. There was a marked change in his disposition, he became happier and at meal times eager for his food. He gained 400 grams or an average of 1 ounce per day. (See Chart No. 5.)

CASE 6. Mary F. Age 15 months. B. F. H. No. 4656.

Admitted for regulation of feeding. She was a 7 months premature baby and her entire feeding history was difficult. P. E. revealed a mentally as well as physically retarded female infant probably due to cerebral injury at birth. There was an extremely large loss of weight immediately after admission with slight fluctuations following, but the general direction on the chart was downward until insulin was given. In this respect this is analagous case to that of Case 1. The gains in weight amounted to 120 grams. It is to be noted that accompanying this gain there is an increase in the caloric value per kilo. This is not an actual increase in diet as the diet was not changed practically since admission, but due to an increase in the infant's appetite. Another feature is that she had a chronic Rhino-pharyngitis which would not yield to local medicaments or the ultraviolet ray but has cleared up since insulin has been given. We had hardly hoped to attain the slight success that we did in view of the fact that she was an extremely difficult feeder.

CASE 7. Patricia B. Age 9 months. B. F. H. No. 4690.

Admitted because of Failure to Gain. Her early feeding history was very stormy. She had been under the observation of Dr. Withington, who brought us a graph of her past weight. In the 8 weeks that he had observed her she had an average gain of 2¼ ounces per week. Admission examination revealed a slight case of rickets and a congenital heart. Previous to admission into hospital the caloric value per kilo of body weight was greater than that given at any time during stay in hospital. (See Chart.) She was given insulin immediately on entrance and we note a rapid gain in first 12 days of 16 ounces or 1 1-3 ounces per day as compared to 2¼ ounces per week. Then the insulin was discontinued. We had great difficulty in finding a suitable food for this infant at this time because she persistently refused her feedings and consequently she lost weight. Finally we put her back on whole milk formula and again started the insulin and she made a very appreciable gain. At this time her heart condition became extremely aggravated and she failed very rapidly. The outlook was grave. Owing to her poor condition insulin was discontinued and two days later the baby was taken home by the parents. Had it not been for such a serious complication we would have considered this a suitable case. (See Chart No. 7.)

CASE 8. Harry Z. Age 11 months. B. F. H. No. 4710.

Admitted 7-14-25 with a complaint of convulsions, duration 7 months. There is no history of any birth injury. Physical examination reveals a physically and mentally retarded child. A diagnosis of microcephalus was made. The child has been receiving practically the same caloric value in the hospital as it had been getting at home. The mother states that it had failed to make any appreciable gain in weight for some time. After admission, following an initial loss, there was a rather marked gain which in turn was followed by a progressive loss. Although the child had gained some since admission, the amount was rather small. With this point in mind and a past history of failure to gain on the outside, we felt that this was a suitable case in which insulin might be of some help. Insulin was administered and there was a steady gain in weight. The total gain after 13 days of insulin was 500 grams. On one occasion the child had a convulsion but owing to the fact that there was a history of convulsions it was uncertain whether this was due to an insulin reaction or was merely part of its past picture. The insulin was discontinued for that day and on the following days the dosage was slightly decreased with no similar recurrence. (See Chart No. 8.)

CASE 9. Elizabeth S. Age 9 months. B. F. H. No. 4642.

This case has been one of unusual interest from our standpoint. The chief complaint on admission was "underweight and unable to properly feed." She had been admitted twice to the On-Shore Department and from there to the Infants Hospital. Many formulae were tried without success. She persistently failed to gain until finally she came under the attention of one of us (H. G.) and the administration of 5 units of insulin b.i.d. tried. During the first week in the hospital her diet was increased twice but as the chart indicates there has been no further change. She has been given insulin at two intervals, the first being 8 days and the second 12 days. It is interesting that the greatest gains occurred during the insulin periods. However she has continued to gain since insulin has been dis-

continued though at a much slower rate. The total gain since entry amounts to 1160 grams or 2 lbs. 9 ounces or an average of over .9 of an ounce daily. (See Chart No. 9.)

On discharge, Aug. 13, 1925, weight was 12 lbs. 9½ oz. On Dec. 3, 1925, baby weighed 24 lbs. This was our most striking case.

CONCLUSION

In our choice of cases we attempted to select the worst in the wards, those with a past history of failure to gain and those who were difficult feeders. The dose of insulin was based on the ratio of 1 unit of insulin per 15 grams of carbohydrate in the diet with the exception of 3 cases.

Case 1— 9 units	Ratio 1-15	Collier
" 2—10 "	" 1-15	Hayden
" 3—10 "	" 1-15	Marcus
" 4—10 "	" 1-13	Vogel
" 5— 6 "	" 1-25	MacDonald
" 6— 3 "	" 1-50	Farrell
" 7—10 "	" 1-15	Byrne
" 8— 8 "	" 1-15	Zamudzien
" 9—10 "	" 1-15	Swartz

One was so near the ratio that it scarcely deserves mention. Cases 5 and 6 received a ratio of 1 to 25 and 1 to 50 respectively. The reason we used such small doses in these latter two cases was because we feared overdosage with insulin. In these latter 2 cases we were confronted with a very unstable appetite and in order to prevent any untoward effects we were compelled to use a much smaller dose. In all cases the diets were kept on as nearly a level as possible. In the 4 cases that we observed an increase in the appetite the possibility is great that this may be due to an increase in the metabolic processes of the organism.

SUMMARY

1. All cases gained with the exception of one and this was due to a severe complication.
2. In six cases, the gains were striking.
3. There was observed an improvement in the general condition in five cases.
4. One case had a doubtful reaction.
5. In two of the cases we not only stopped the progressive loss of weight but succeeded in obtaining a slight gain.

We do not wish to leave the impression that insulin is the panacea for malnourished infants but we are merely attempting to offer our own observations on a limited number of cases.

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THE FEEDING OF THE NEWBORN INFANT FROM THE OBSTETRICIAN'S POINT OF VIEW

BY FREDERICK C. IRVING, M.D., F.A.C.S.

In certain clinics the question arises as to whether the obstetrician or the pediatrician should feed the baby. In the hospital with which I am connected it is the consensus of opinion that the mother should feed the baby. Since the mother is admittedly the obstetrician's patient, it follows by a simple process of reasoning that he should advise her how this may be brought about. The chief reasons why a baby fails to gain on the breast, given a normal infant, are because the milk is not good enough, or because the baby does not get enough of it. The cases in which the milk is not good enough are uncommon compared with those in which the nursling does not obtain a sufficient supply.

The baby may not get enough milk to make it gain for one or both of two reasons. These are (1) because there is not enough milk in the breasts and (2) because he does not empty the breasts. The most powerful stimulus to the abundant flow of milk is nursing. Unless the point is reached where the mother is exhausted thereby the more often each breast is stimulated by nursing the more milk there will be for the baby. Very little trouble is experienced in a maternity out-patient department in maintaining breast feeding. This is not due to the fact that the district patient more nearly resembles the peasant type than her more fortunately placed sister and is thus endowed with more bovine qualities. It is because the baby is nursed whenever it cries and because it cries much of the time. It is fair to say, however, that the establishment of any such regime in a well regulated household would be to invite chaos. How then may we bring about more frequent stimulation of the breast and at the same time give the patient more opportunity for rest and relaxation between nursings? This may be accomplished by putting the baby to both breasts at each nursing and keeping it on for ten minutes at each side. If the interval between feedings is made four hours instead of three and the baby is put to both breasts at each nursing instead of to one, each breast is being stimulated half again as often. If the baby fails to gain on this routine, he may be put to both breasts every three hours, in which case each breast will be stimulated twice as often.

If, in spite of more frequent stimulation of the breasts, the baby still does not make satisfactory progress the suspicion arises that the breasts are not being completely emptied. It is advisable to weigh the baby before and after

each nursing to ascertain how much it is getting in comparison to what it should obtain. We then proceed to extract the residual milk from the breasts which may be accomplished by either the electric pump or by hand stripping. The hand breast pump is a very feeble apparatus and is not worth a trial. Hand stripping, although theoretically ideal because it requires no mechanical device, is not so perfect as some of its advocates would make us believe. Much difficulty is frequently encountered in teaching not only mothers but even nurses to use it successfully. On the other hand the electric pump is very efficient, thoroughly empties the breast and only rarely causes the patient discomfort. Such a pump may be rented from supply houses for a moderate sum and used by the patient in her own home. The residual milk thus obtained is fed to the baby, and as its strength and size increase the necessity for pumping usually disappears and the baby succeeds in emptying the breasts itself.

I do not mean to imply that all babies should be put to both breasts every four hours, or that all breasts should be pumped for the remaining milk that they may contain. The chief essential is the exercise of common sense, which requires that the method of feeding should be regulated according to the requirements of the particular baby and the milk-producing ability of the individual mother. The chief pitfall to avoid is the early addition of cow's milk. Putting the baby on a formula before it has had a chance to show what it can do on the breast has dried up the maternal milk supply more frequently then any other one cause.

I wish to say a few words about other methods of increasing the milk supply. From time immemorial nursing mothers have been plied with fluids for the purpose of making more milk. Since milk is actually manufactured in the breasts and is not a transudate from the blood it is hard to see how the ingestion of large amounts of cow's milk will have any effect but an indirect one. There are, however, many women in whom the quantity of milk is increased following the drinking of much fluid, and this phenomenon follows the taking of water quite as frequently as that of cow's milk. In such cases the fluid probably acts as a vehicle for the nutritious constituents of the milk. When once the breast milk begins to disappear it is very seldom that drinking large quantities of anything will bring it back.

Various galactagogues are on the market. When pituitary extract was first put out as a drug it was stated that it would increase the supply of milk, diminish abdominal distension, raise the blood pressure, make the uterus contract and cause the patient to urinate. We now know that it is a powerful ecbolic and that given in large doses it will stimulate the intestinal musculature. Its other therapeutic virtues are largely apochryphal. Experience with commercial galactagogues has not been promising. Placental extract has been advertised and sold as a means of increasing the milk supply. The work of Frankl of Vienna would tend to prove the opposite. He implanted fragments of placenta in the bodies of pregnant mice and found that when they came to term and were delivered their young invariably starved because their mothers gave no milk at all. Theoretically, therefore, the administration of placenta to a nursing mother would be the worst thing possible to do, provided it had any effect whatever.

The types of patients with whom breast feeding should not be attempted are very few. Active tuberculosis is, of course, a contraindication, as is any debilitating intercurrent disease. A prolonged, exhausting labor is not a contraindication, as by the time that lactation is established the patient's condition will have improved sufficiently so that nursing will do her no harm. Toxemia is no contraindication to nursing, but a marked anaemia, such as that following placenta previa where much blood has been lost, is a contraindication. One of the most trying situations in private practice is that in which the mother announces that she does not intend to nurse the baby because it restricts her social activities or because it is unaesthetic. Under such circumstances the obstetrician should use every means in his power to secure breast feeding, even if he knows that the patient will defeat him in the end.

HABITUAL VOMITING, INANITION AND CONSTIPATION IN A CHILD ASSOCIATED WITH MEGACOLON AND CURED BY BOWEL MANAGEMENT

BY SARA M. JORDAN, M.D.

THE condition of megacolon or dilatation of the colon was given its name, Hirschsprung's disease, when in the years 1887 and 1888 Hirschsprung reported the gross pathological and histological examination of three hypertrophied and dilated colons removed at autopsy from male children, 2 months, 8 months and 11 months of age. The youngest of these showed no ulcerations, whereas the two older specimens showed ulcerations of the mucous membrane which Hirschsprung believed were secondary to irritation from catharties, enemata, or fecal masses. The symptoms which had been present since birth were difficulty in defaecation attended by intermittent distension of the abdomen and occasional vomiting. Severe diarrhoea was

the immediate precursor of death. In the second of his two communications, Hirschsprung compares this condition which he believed was a congenital idiopathic dilatation of the colon, apparently purposeless and local, to the congenital dilatations of other parts of the intestinal

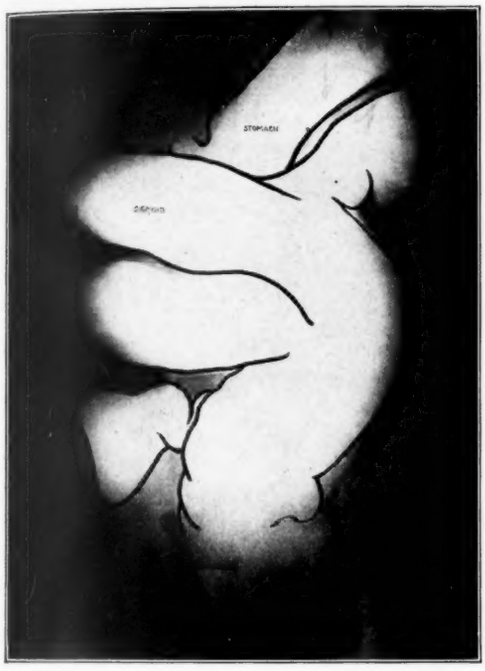

FIG. 1, showing extreme dilatation of the entire colon. Stomach pushed up by the full colon.

canal such as the stomach or oesophagus.

A rather different point of view is upheld by Saias in 1905 who considered Hirschsprung's disease merely the result of habitual congenital constipation in an extreme degree. This condition in turn is due, in this author's opinion, to an exaggerated length and to numerous inflexions of the pelvic colon which cause dehydration and fecal stasis. The latter causes chronic colitis and hypertrophy of the colon.

In addition to these two views which hold to congenital deformities as the direct or indirect cause of the condition, there are other explanations for the condition based on inflammatory, mechanical or neuropathic causes. It was first suggested by Koeppe and Moser that constriction of the gut due to spasm either at the anal sphincter or at some proximal point produces dilatation and hypertrophy because of the obstruction distal to the affected area. This spasm according to Behring and Klercker need not be demonstrable. These authors consider Hirschsprung's disease merely a syndrome which may be congenital as described by Hirschsprung or due to an obstruction from spasm.

The treatment of this condition was first undertaken surgically by Finney in 1908. Radical resection of the colon has been done in numerous cases and has been demonstrated to be of more value than anastomosis because in the cases with anastomosis only, the remaining section of bowel has frequently dilated and caused new difficulties. Huber in 1924 reports a successful case in which a total resection of the colon was done, and a side to side anastomosis of lower ileum with upper rectum was made.

The condition of megacolon has been treated medically with irrigations, pituitrin, dilatation of the rectum and dietary regimes, but such treatment has usually been reported as palliative only. The case here reported is that of a boy nine years old who was sent to the clinic with a question of pyloric stenosis. There was a history of nausea and vomiting occurring from infancy on, twice a day. The child was never known to have been hungry—had constantly awakened in the morning with nausea. Vomiting had occurred about one hour after meals and had always relieved the nausea which constantly preceded vomiting. The ingestion of a meal had usually required about one and one-half to two hours, because of the patient's nausea and distaste for food. Bowel function had never been normal, evacuation having been obtained by the daily use of cathartics or enemata. The child had had no other illnesses. His mental development was normal and progress in school above the average. He had, however, never played normally with other children and had shown a tendency to prefer solitude and

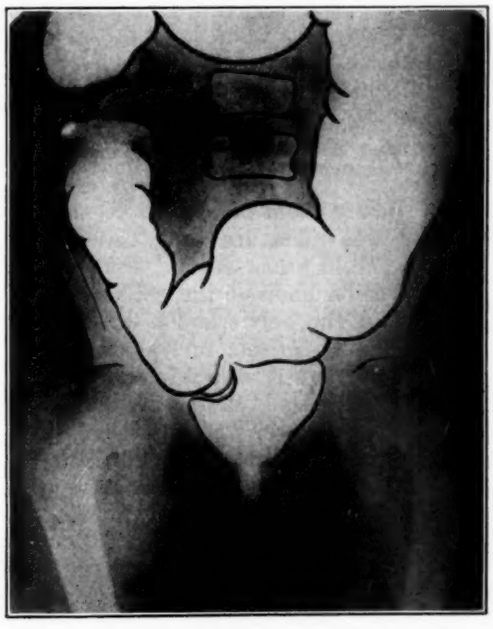

FIG. 2, showing condition after one week.

reading. Physical examination showed a pale apathetic appearing child of normal height, but undernourished. Except for two carious teeth, head, chest and extremities showed no abnormality. The abdomen was thin-walled and showed venous engorgement, and there was con-

siderable distension with tympany. There were no tenderness, spasm, or abnormal masses felt. Rectal examination revealed moderate spasm of the sphincter muscle, but no other abnormality. X-ray examination by means of fluoroscopy and plates with barium meal and enema showed a stomach of normal size with no apparent lesion of its walls and no obstruction at the pylorus. It was impossible to observe the filling of the duodenum, however, for both stomach and duodenum were held high and showed evidence of

FIG. 3, showing the position of the stomach after extreme dilatation had been relieved.

marked pressure from below. It seemed at once clear that this pressure was the mechanical cause of the child's nausea and vomiting. A six-hour observation showed the coils of the ileum held up out of the pelvis and a large residue in the stomach. An enema on the following day showed an enormously dilated colon which filled the entire abdominal cavity, the sigmoid extending up to the liver and ensiform. Extreme dilatation was present throughout the entire colon from rectum to caecum and the child experienced severe distress from the filling with the enema. (See Illustration 1.)

The cause of the child's symptoms was now revealed—direct mechanical pressure upon the stomach and upper intestinal tract and reflex irritation from the extreme dilatation of the colon. It then became a question of whether the patient should have surgical treatment, appendicostomy and irrigations or medical management. It was decided that bowel management should be tried over a period of three or four weeks with frequent observations to determine whether or not improvement occurred.

Illustrations 2, 3 and 4 show the condition on X-ray examination in one week, two weeks and one month respectively. The large distended

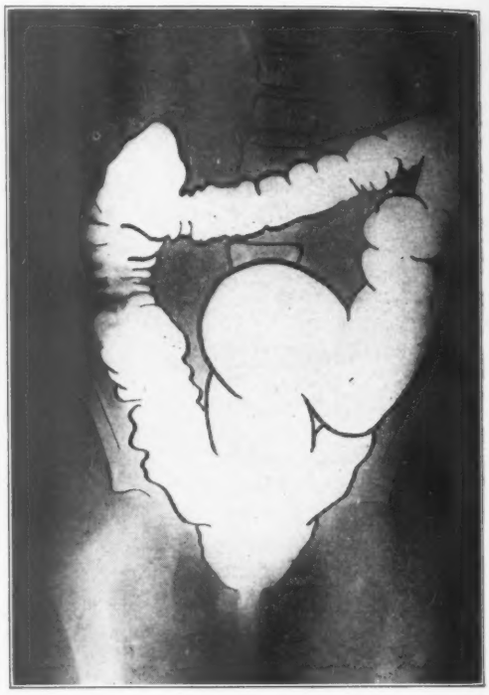

FIG. 4, showing condition after two weeks.

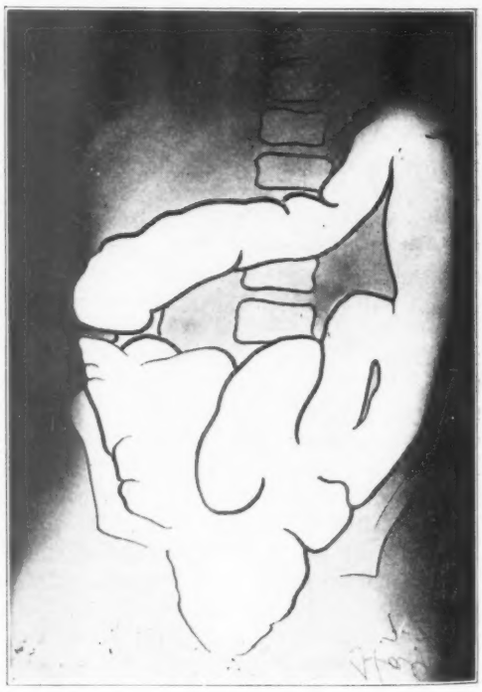

FIG. 5, showing condition after one month.

bowel gradually became markedly reduced in size and thus allowed the stomach to assume its normal position. The clinical improvement resulting from this mechanical restoration of

normal relationship was much more striking. The child gained at the rate of two pounds weekly, his color became ruddy, his eyes bright and his behavior with other children normal. He had no recurrence of nausea or vomiting. He was encouraged to record the time consumed in the ingestion of all his meals and succeeded in finishing them in twenty minutes to one-half hour, with apparent enjoyment of the food eaten. He has now been followed for thirteen months. His bowel function is entirely normal. His gain in weight is 32 pounds, and his appearance is now that of a well-nourished, healthy, fun-loving boy and offers a striking contrast to his appearance of one year ago.

A most descriptive comment was made by his mother on the change in his condition in a remark that in the year previous to treatment he had worn out two pairs of shoes, whereas in the year following the beginning of treatment he had worn out seven pairs of the same type shoes.

The treatment followed in his case consisted of putting the colon as completely at rest as is possible. The boy remained at rest in bed for three weeks on a diet, low in colonic residue and free of chemical irritants to the colon. Heat and antispasmodic drugs were administered for a time. After four weeks no further medication was given and cathartics or enemata have never been given since the beginning of treatment.*

*Since this case has been treated, a somewhat similar case in a five-year-old child was reported in the Archives de Médicine des Enfants—April, 1925, 28 (224-230)—by Labbé et Aizière. They used small enemata and a rectal tube, but in other respects their treatment was similar and successful for eighteen months after the beginning.

NEW ENGLAND PEDIATRIC SOCIETY

THE VALUE OF THE PREVENTORIUM IN TUBERCULOSIS WORK*

BY WALTER A. GRIFFIN, M.D.

THE State of Massachusetts is making liberal provision for children who need preventorium care. At Westfield there are 310 beds. At North Reading there will be 200 beds for children in a short time and at Lakeville there will soon be generous accommodation for surgical tuberculosis. The ten year program has been under way long enough to show that there are many school children who show evidence of tubercular disease and therefore have a need of treatment. Already, in the three years that this state survey has been in progress, enough cases of hilum tuberculosis have been found to fill all the present and proposed beds, to make no mention of the numbers showing definite physical signs of disease of the lung parenchyma of adult type that should go for treatment to a sanatorium rather than a preventorium. In view of these state activities it is desirable to inquire how valuable the preventorium is in tuberculosis work; whether, in fact, it fills a need that cannot be filled as well or better by other agencies such as the dispensaries, open-air schools and summer camps, to mention public or semi-public agencies; or whether the home, under proper supervision by public agents, or by the home doctor and nurse, is not, after all, the best place to build up body resistance to the tubercle bacillus.

If the real need of preventoria exists there can be no thought of the cost, and, in fact, there would be no occasion for considering the monetary expense inasmuch as means are always forthcoming whenever needs are properly presented to the public.

Let us, for a moment, briefly consider how urgent these needs may be. We have to admit that the tubercular death rate has fallen to a marked extent. Part of this fall is doubtless due to improved methods of living and better health knowledge, but even with poor environment and ignorance the incidence of tubercular disease has improved.

Without too much detail we may quote some results of recent investigations. Drolet[1] states "In the general and normal child population tuberculosis infection is probably now less frequent than has usually been thought to be the case." He speaks from conditions that he finds in New York City and these certainly can hardly be expected to be better than any other large American city. Accepting his statement must give us courage to believe that conditions are certainly better than have been reported by Hamburger and others in European cities. It does not mean, however, that the millenium as regards tubercular infection is yet in sight, for Drolet states again[2] that "the lowest percentage of tuberculin reactions in children under one year of age from various surveys rarely ranges lower than 10 to 12 per cent. with greater proportions in congested parts of the city . . . This would indicate that there are, at the minimum figure, 13,000 children under one year old in New York City who are already infected with the tubercle bacillus." All surveys, further, have shown that the number sensitized to the tuberculin test increases with each year of life. It cannot be denied, therefore, that the numbers of children who have received infection with the tubercle bacillus throughout the country are tremendously large. Any percentages would, at best, be but estimates.

*Read at the meeting of March 12, 1926.

It is indeed fortunate that infection with tuberculosis does not mean sickness from the disease, and, in fact, as Bushnell, in his book on "The Epidemiology of Tuberculosis," has so clearly emphasized, infection of proper amount is a tremendous boon to the individual by conferring a needed immunity to one who has to live in the dangers peculiar to civilized communities. The mere incidence of tuberculosis in children, as noted by the tuberculin tests, should not therefore be taken to indicate how much need there is for treatment.

A more exact point of view may be had by considering the deaths from tuberculosis among children under fifteen. In 1923 this figure was 28 per 100,000 of population for the whole country, and in New York City it was a little higher, namely, 35 per 100,000. This would give nearly 600 deaths from tuberculosis among children in New York City for that year, with the estimated child population of the city of 1,679,252. It can hardly be questioned that many of these 600 cases could have been saved by proper treatment.

I may perhaps present some figures from the tuberculosis clinic that I have conducted once a week at Norwood, Mass., for ten years. In that time I have given physical examinations to 212 children from one to sixteen years of age, and in that number I have noted fifteen underweight, sixty-five cases of contact; twenty cases of hilum disease either suspected or afterwards proved in a few instances by X-ray examination; definite enlargement of the cervical glands in eighteen; definite lung signs of bronchitis in thirty-four, of pleurisy in three, of adult type of tubercular disease in four. Of these children examined fifteen cases have been sent away to preventoria or sanatoria for varying lengths of time. Some others were considered suitable cases for preventorium care but for various reasons it was found impossible to send them. No record was kept of how many there were of these latter cases, but certainly a conservative estimate would be that they were as numerous as those who were sent away for treatment. It is probable that if the clinic had had the advantage of an X-ray outfit even more cases might have been discovered with presumptive hilum disease. Enough were found by general physical examination to warrant the thought that throughout the state similar clinics would show that there are more cases of hilum tuberculosis of a sufficient state of morbidity to require treatment than can be cared for by any present or proposed accommodation.

To prove that there is need of treatment for cases of hilum tuberculosis is not to give sufficient evidence that preventoria are necessary, since the majority of the cases could all, without doubt, be taken care of more or less well by other agencies as they have always been cared for in the past. It is because we believe that preventorium care is best that we are presenting it at this time.

It has to be admitted at the start that there is nothing new or startling in this care. The fundamentals of fresh air, proper food and rest are the chief elements to be provided, and any innovations are merely side issues. It is because these essentials are most easily obtained in the preventorium that the chief value of it is found.

Consider the first factor—fresh air. It means that in order to obtain it properly one should be in it as nearly twenty-four hours a day as possible. A child under treatment should have a bed on an open porch for rest hours, day or night, and waking hours should also be in the open, whether at school or at play. These simple rules sound easy, but in ordinary city life they are almost impossible to carry out and even in the country it is hard, particularly with the lamentable dearth of fresh air schools. On the other hand, foul air at a preventorium is hard to find and children are practically always in the open.

Proper food is again of tremendous importance in building strong resistant bodies. If poor feeding of children were not so prevalent I doubt if the pediatricians would have as much to do. Improper diet for children is found in the homes of the rich as well as in the homes of the poor, and frequently children are half starved in the presence of plenty. If, in addition, a tubercular infection be present, we have to remember that a fickle appetite frequently goes with it. Hence, we find underweight a cardinal symptom of hilum tuberculosis. In order to overcome this tendency to poor or improper eating it is usually not enough to give instruction to parents and guardians. A child may be led to a dish of oatmeal of a morning, but it often takes firm persuasion to overcome a distaste for it. On the other hand, where playfellows are partaking greedily of it appetite is created. Furthermore, articles of food of doubtful value are not in sight to create improper longings, and the desire for healthful, nutritious foods is fostered. This desire is of course helped to a considerable extent by the life in the open air. As a matter of fact, the question of appetite for proper foods is a negligible quantity in the preventorium and rapid gain in weight is so much the rule that failure to gain always occasions surprise and stimulates search for some complicating factors. I have at present a little girl at Sharon who has gained twenty-one pounds in four months. Three other children from one family, who have been at the preventorium less than a month, are showing gains of 1½, 1¾ and 2¾ pounds. These latter children I have known for six or seven years and have always noted their puny frames. If they continue as they have begun at the preventorium, they will soon be huskies, for not alone has the weight increased, but the whole

look of the children has changed, and they would not now, by their appearance, be considered frail.

Rest is the third of the essential triology of treatment. At the preventorium the bell rings and some part of the daily routine changes. Meals, study hours, play and rest periods are all arranged by its ringing. Half of the twenty-four hours is spent recumbent by all the children and of course special cases take more time in bed. The notable point is, that there is nothing to distract from the rest prescribed. There are no visitors after hours, no late movies, no temptations for late retiring. In consequence, the regular schedule is not broken over as it is so frequently in the home. Furthermore, certain cases requiring extra rest periods are easily taken care of and others who suddenly show a little temperature or other suspicious symptom are quickly put to bed and kept there till their cases may be studied. Thus dangerous upsets are often cut short. In fine, rest can be more properly supervised in the preventorium than anywhere else, and since it is of such paramount importance it alone enhances greatly the value of group treatment.

Other advantages may be mentioned besides the three already enumerated. For example, the value to professional knowledge. We have children collected in numbers and in various stages of infection or morbidity or recovery. For clinical study nothing could be more advantageous and some of the present questions of doubt would best be solved in such a grouping of patients. At present differences of opinion still exist as to what factors make most surely for diagnosis, meaning by that the approximate diagnosis with which we, at present, have to be satisfied. It will be by study of numbers collected into groups such as are to be found at preventoria that diagnostic criteria will become best evaluated. Further, the presentation of new tests may be best expected to come from such institutions where closest daily observations can be made. Again, new methods of cure can here best be tested. The Rollier treatment, for example, has been proved of immense value even in our uncertain Eastern climate by Lo Grasso. From time to time other treatments, new and old, will and should be tried and the preventorium is the best place for any such experimental work.

Finally, there are certain advantages to the general community which are sure to come from preventorium care of children. For example, in the same way that the sanatorium care of adults awoke the public to the value of open windows and rest in the treatment of lung trouble, so similar care of children will teach that they should not be closely housed at any time and that they should have, in addition, proper and adequate rest and food, in case they show signs of a broken immunity to tuberculosis. Furthermore, the children act as missionaries of health and keep alive the ideas they have gained, as a group of children from the poorer parts of Cambridge who came to the Sharon Preventorium. They were not pleased to come but when they had to go home they had gained such an affection for us that they formed what they called the "Sharon Club" and on several occasions they had excursions and picnics together in the outskirts of the city, to enjoy again the freedom of the out-of-doors.

In conclusion, we have to admit that about five per cent. of school children show definite signs of hilum tuberculosis, as has already been proved by the Massachusetts survey now in progress. This would mean between 35,000 and 40,000 such cases in this state. Fortunately, the majority do not need intensive treatment. For those that do need it there is no question in the minds of those who, like Chadwick at Westfield, have given most time and thought to the matter, that the preventorium should be the treatment of choice. Here the children go to open-air school, not for a few hours, but for the whole day; here they receive extra and proper nourishment, not for one or two meals, but for all the time; here they rest when they should, whether by the regular schedule or according to special needs. Here, also, they are with their fellows, having the good times that only the "gang" can have. The preventorium, in short, gives the nearest approach to that desideratum of all treatment—a return to nature.

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REMARKS ON THE DECLINE OF MORTALITY FROM TUBERCULOSIS AMONG INFANTS AND CHILDREN*

BY ALLEN K. KRAUSE, M.D.

If we examine the vital statistics of New York City we find that since 1900 the death-rate of tuberculosis has been cut in three for the general population, in four for children under fifteen, and in six for infants. Therefore, tuberculosis mortality has been declining more rapidly among children than among the people at large and more rapidly among infants than among children; that is in New York City.†

While, between 1900 and 1921, the general mortality from tuberculosis in New York City

*Presented at a meeting of the New England Pediatric Society, Boston, Mass., March 12, 1926.

†The statistical matter in regard to New York City has been taken largely from "Tuberculosis in children. A review of the mortality during the past quarter-century in New York City," G. J. Drolet, American Review of Tuberculosis, June, 1925, Vol. XI, pp. 292 et seq.

was falling by 63 per cent, that for its children declined 73 per cent. In the United States Registration Area the greater decline for children was not so marked, for between 1900 and 1921 the reduction of their tuberculosis death-rate was 56 per cent as against 51 per cent for all inhabitants.

Since present tuberculosis rates for the United States, for our colonial states of the Atlantic seaboard, and for our older cities like Boston, Philadelphia and New York, are from one-third to one-quarter of those of a century and more ago, we are no doubt entirely correct in stating that the situation of our nation's children in regard to tuberculosis was never better than now. Furthermore, it is improving at a rate and to a degree that are altogether new in the history of epidemiology.

In 1898 the deaths of children constituted between one-sixth and one-seventh of all deaths from tuberculosis in New York City; in 1923 they made up less than one-tenth of the total number. Within the same period the toll of tuberculous meningitis dropped from 78 to 17 per 100,000 children, and of pulmonary tuberculosis, from 31 to 10; while tuberculous peritonitis, with a death-rate of 1 for 1922 and 1923, has become hardly a factor in the mortality of childhood after infancy. Tuberculosis has always been responsible for fewer deaths in childhood (proportionately) than at any other period of life. It is therefore almost startling to find that its ravages among the infants of New York City now fall below the sacrifices exacted of the children of a generation ago. A meningitis rate of 353 for infants in 1898 has become 51 for 1923; a pulmonary rate of 84 descends to 22; and peritonitis mortality plunges from 50 to 5.

While New York City's experience with tuberculosis may not, without further inquiry, be taken as a gauge of tuberculosis elsewhere, there can be little doubt that, in outline, it is representative, and "symptomatic" of general trends. You may recall, in this connection, that Emerson[1], of your Boston Health Department, found not long ago that between 1898 and 1921 mortality from pulmonary tuberculosis in Boston had declined more during the age-period *birth to ten years* than for any other ten-year age-period. We have already seen, also, that in the expanding Registration Area children enjoyed a 5 per cent greater reduction than all inhabitants of their tuberculosis death-rate.

This sensational decline of fatal tuberculosis in early life must be of great significance,—if only we knew what is bringing it about and what it means,—if, too, we were certain of our ideas concerning the relation of childhood tuberculosis to the development of the more common manifestations of the disease in later life. Without regard to any hypothetical peculiarities of infantile and puerile constitution and their probable contribution to the general result, we may be sure that whatever factors have been cutting down tuberculosis among all elements of the population,—and these are undoubtedly numerous,—the same factors are in operation among infants and children. Earlier and better diagnosis, earlier and better care of discovered or threatening tuberculosis, social and public hygiene and a growing sense of personal responsibility, and ever-developing and expanding standards of living must exert on childhood tuberculosis essentially the same effects as upon adult tuberculosis; and there has never been any serious disagreement about the general proposition that those effects are expressed in preventing and aborting the evolution of the disease.

But what would seem of special significance is that we have evidence to show that latterly there has set in an assuagement of tuberculosis that appears ever greater as we proceed from the later years, through the earlier years and into the first years of life. To the student of tuberculosis the circumstance at once suggests that a prime factor responsible must be one that is concerned with the infectious agent rather than with the recipient and the variable play of external forces upon the latter. When fifty million adults in a long and thoroughly tuberculized community are showing fewer and fewer deaths from tuberculosis from year to year, we naturally look to their environment for the reason for their diminishing mortality, and to an environment in which the part played by infection is relatively small; for we know that a large proportion of all cases of progressive pulmonary tuberculosis of adult life develop, not from infection newly received, but out of infection laid down in early life. On the other hand, the earlier the age at which manifest tuberculosis develops, the more certain we may be that it is the character of the infection—its virulence, its quantity and its repetition, as well as its initial focalization—that determine morbidity and mortality, rather than external stresses that modify the soil.

No doubt, the mandatory pasteurization of milk in New York City has made for a good deal less active tuberculosis in infancy and childhood: the great decline in the deaths from tuberculous peritonitis is almost direct proof of this probability. But it will hardly account for the magnitude of the diminution of mortality. A proportion of one-quarter of all deaths from tuberculosis in early life is all that the least conservative statements have been willing to allow for the part played by the bovine bacillus in mortality. While Winslow and Gray[2] were able to discover few evidences of correlation between the pasteurization of milk and deaths from tuberculosis, pulmonary and non-pulmonary, in infants under one year in a group of American cities, they did find that for the age-period one to four years "the practice of pasteurization has begun to yield fruits

which are susceptible of statistical demonstration." Briefly, in cities with thoroughly pasteurized milk supplies nonpulmonary tuberculosis mortality was about 75 per 100,000 for age 1 to 4, while in cities without effective pasteurization it was 100. In both instances the rate for pulmonary tuberculosis was about the same.

It would be difficult to explain so enormous a reduction of the death-rate as has taken place among the infants of New York City in the short space of twenty-five years,—namely, from 609 to 94,—on any other basis than that of greatly diminished opportunities for infection. If we consider the character of the population that has always supplied most fatal cases of infantile tuberculosis, that is, the poorer people with their large contingent of foreign birth, among whom breast-feeding is the rule, the presumption is that any diminution of infection has been largely one of human-bacillus type. This presumption is borne out by such other circumstances as a reduction of approximately 75 per cent in the rate for pulmonary tuberculosis, which is, with few exceptions, set up by the human bacillus, and of almost 85 per cent in the rate for meningitis which is preponderantly due to the human bacillus.

It would appear, therefore, that in a community like New York City the sum total of tuberculous infection is much smaller than it was twenty-five years ago, and that it is continually growing less. Indeed, these enormous declines in infantile death-rates are the best and most convincing evidence of a lessening of infection that we have had in the entire history of tuberculosis. And while, as has been stated, New York City does not stand for the United States, it does point toward the operation of a general tendency, one, too, which all other available statistical evidence confirms. We are justified in assuming, therefore, that our children's contacts with tuberculosis are being greatly reduced quantitatively, and that this circumstance is making for much less severe tuberculosis and death.

Taken by themselves, the various cutaneous tests inform us merely about the incidence of tuberculous infection. They tell us little or nothing concerning its quantity, its frequency, and its vigor, and the slightest infection that "takes" will sensitize just as surely (though probably not as permanently) as the heaviest intake of bacilli. Therefore, we could hope to learn but little about the general alterations of severity of infection among our infants and children by using skin tests as our indicator. But if we should take selected geographical areas and within them practise inclusive enough skin-testing over a sufficiently long period—say for ten years or more—we might learn something about the very important matter of whether the incidence of tuberculous infection is lessening among children, or whether first infections are being appreciably postponed.

Although I haven't a shred of direct evidence to support the opinion, I am inclined to believe that children with tuberculous infection are becoming fewer. No doubt much of my belief rests upon the shaky premise that such ought to be the case. When 88 die of tuberculosis where 202 died twenty-five years before, when 150,000 pulmonary patients enter sanatorium walls every year where perhaps not 10,000 sought internment a quarter-century ago, when several million of our city children are getting fairly clean milk when their older brothers and sisters were accustomed to drink it in every condition other than clean, I can't help believing that more children than ever before are unconsciously steering clear of the tubercle bacillus. Until lately I was always inclined to look with some suspicion on reports of the incidence of childhood infection (as determined by skin tests) which made this unusually low according to our standard ideas formed largely between 1910 and 1915. Today there is just about half the general mortality from tuberculosis that there was then; and I am beginning to wonder whether these later records are not revealing to us what we are too blind to see; that is, that the number of infected children is *growing* smaller.

It is now almost ten years since a large proportion of the children of your neighboring community of Framingham was being tested for tuberculous infection. Their infants then have now entered late childhood and their children become youths. If a new series of tests were now performed on Framingham's children, comparable in number, age and condition to those tested from 1917 on, any marked deviation from the figures of a decade ago would render the study one of the most important and significant ever undertaken in the epidemiology of tuberculosis. Standing alone, the results of Framingham's tests of 1917 to 1920 mean comparatively little. They merely confirmed what was already common knowledge. But, set over against a new series of records, they might serve to lend scientific support to new concepts of the epidemiology of tuberculosis.

One prime factor in the development of progressive tuberculosis is a more than ordinary severity of the infection, its quantity, its repetition and the interval between successive infections. This is one of the few elements of the etiology of manifest tuberculosis that can be proved by direct scientific experiment, and we regard few of our opinions as well grounded as this one. In view of all the evidence, it furnishes us with the only reasonable explanation we have for the frequent recurrence of tuberculosis in families in which the parent may have died years before the appearance of disease in the child. Everything else being equal (though it never is) one thousand severe infections will eventuate, perhaps years later, in more cases of

illness than a similar number of lighter infections. Given environmental factors of a kind to favor quiescence of tuberculosis, the cases that become active should, in general, be those which began with the burden of more than average or "sufficient" infection.

Of late years the broad social and economic movements of our civilization have brought about conditions of antituberculous tendency; to an extent that they have operated on the average man enough to bring down average tuberculosis mortality. If they continue as they have been, they will keep cutting into tuberculosis and its death-rate indefinitely. With time they tend to set up conditions that make their task easier and lead to the establishment of a beneficent cycle. The infected young also respond to their influence and fall prey less to active tuberculosis and death. The young also receive less infection, as pulmonary tuberculosis of later life becames markedly reduced; and, receiving less infection, the young carry less of it over into later life, there to ripen into serious pulmonary disease.

We may therefore predict that, if our environmental conditions do not suffer radical alteration, the growing improvement of the situation of infants and children with regard to tuberculosis, and the undoubted lessening of the severity of infection in early life must carry with it the assurance of less adult pulmonary disease and a reduction of mortality for years to come—for an indefinite time. I am not of those who believe that all adult tuberculosis arises from seed implanted in childhood, and have frequently voiced my reasons for being compelled to assume that much chronic lung disease of later life proceeds from foci of reinfection from without. But even the latter must grow more infrequent with tuberculosis tumbling down as it has been. That a great deal of late pulmonary tuberculosis is early infection brought to fruition no one who interviews and examines patients for an afternoon can doubt; and more and more of this, as we have been seeing it, will never reach the light as early infection continues to decline in severity.

Thus, as has happened in malaria and other infections, tuberculosis, once it has declined to a certain (as yet unknown) level or total of infectiousness, may have a way of solving itself. There may come a time when not enough tubercle bacilli "remain at large to infect mankind sufficient to maintain a given level of mortality —*with, of course, environmental factors what they are.*" Perhaps that time is already here. If it is, the child looms larger than ever in the scheme of tuberculosis.

REFERENCES

1 Emerson, J. O.: A statistical study of the decline in the number of deaths from tuberculosis of the lung in the city of Boston, 1898-1921. Amer. Rev. Tuberc., Jan., 1923, VI, 994

2 Winslow, C.-E. A., and Gray, C. E.: Tuberculosis mortality in relation to the pasteurization of municipal milk supplies. Ibid., Oct., 1924, X, 186.

Discussion

Dr. Cleaveland Floyd: In regard to treating tuberculosis, it seems to me, it is important to look for the following two things: Pick out the attack of infection in the exposed child and watch it for a period of time and try to prevent recurring infections, if possible, or build up immunity to subsequent infections. The preventorium is of great advantage chiefly in crowded sections of the city where rest, good food and fresh air are not adequate. The larger field of prevention is teaching the parent. It is impossible to teach the adult in a hour or so the routine which is carried on in the preventoria.

I have seen children who have been in preventoria come home and do perfectly well, gain in weight and their lungs improving all the time as shown by X-ray. It is in these cases where the parents have learned the lessons from the child who has been in contact with the preventorium.

Here we take only contact cases as infected as shown by vonPirquet Test and say that infection has taken place in the children. How is it going to affect the child who is infected with tuberculosis? A study by X-ray, it seems to me, especially of the hilum region shows two things clearly. One—we must remember, as shown by Dr. Krause this evening, that when the tubercle bacilli get into the mucous membranes they go on until the hilum glands are involved. This course takes place a great many times. Infection upon infection piles up until other glands are broken down. Some of the tissues around them may be tuberculous: others are not. It is important to remember that a constant bombardment on these vital glands is constantly going on.

I think Dr. Krause's talk is particularly valuable in this respect—if we are going to prevent the chance of infection to these vital glands, we must prevent childhood infection.

Dr. R. D. Leonard: It would be rather presumptuous for me to discuss these papers outside of the line in which I am particularly interested, namely, X-ray.

I would like to add a word as to my idea that the X-ray plays in the diagnosis of chest tuberculosis in children.

The hypothesis we work out is that the natural course of tuberculous infection can be compared in its various stages to the infection of syphilis, i.e., we have the primary lesion in the lung and then we have the secondary stage which may be primary or be associated with the primary lesion which is mild or may be severe. This latter, perhaps, we have seen and might be called the tertiary stage. This latter stage is the adult type of tuberculosis.

In the X-ray study of tuberculosis in children, we are limited directly in the ordinary cases of tuberculosis to the first two stages—primary and the secondary stages. In the or-

dinary primary infection which has been described more or less this evening, the primary focus may be found as a discrete calcified shadow in the entire portion of the lung. We believe that this represents the initial lesion. This may be of two types in children. The ordinary type is the picture as seen in children with pertussis, in which the organism is not virulent and few in number where normal healing takes place, or its immunity is established and protects the child from serious tuberculosis of the lung. There is also the type of primary infection which is overwhelming in which the organisms are perhaps more virulent and greater in number and the child has no opportunity to establish immunity or make any attempt at healing. This picture is of the adult type. It is associated with miliary tuberculosis. This is an unusual and rare condition in children.

The second stage which is the stage about which we are frequently consulted and concerned is the form which is characterized by the enlargement of the glands at the roots of the lungs and a certain amount of thickening, with more or less calcification. This brings up the problem of hilum tuberculosis. In discussing this condition from the X-ray point of view, some pathologists say that the evidence of calcification is pathognomonic of tuberculosis. If these enlarged glands and lung thickening mean tuberculosis of the chest, the vast majority of children from the X-ray point of view have tuberculosis. We have assumed that it is more or less a childhood disease. Personally, I do not believe that X-ray is of great help in making the diagnosis of hilum tuberculosis.

DR. HENRY D. CHADWICK: I have been much interested in Dr. Krause's paper and have always looked upon Dr. Krause's work in tuberculosis as the gospel truth.

In regard to Dr. Griffin's paper, I would say that I feel the preventorium treatment is the ideal one, but it is not possible to give all the children that need it that sort of treatment in the hospitals. Therefore, we must try by teaching the parents—get them to carry out in their homes the fundamental ideas which have been found useful in the preventoria and sanatoria for children.

I would like to add one more statement to what Dr. Krause has said in regard to the work that Massachusetts has been doing through its Department of Public Health on its school children.

We have in the last year carried on a study in trying to find how many children were infected with tuberculosis by means of the von-Pirquet test. We took all the school children who were 10% underweight and who were in poor general condition making 15% of the school children of the elementary grades or 10,600 children who had to be vonPirqueted. The tests were made with tuberculin obtained at the Saranac laboratory and were done by two men so that the work was uniform. The reading of the results was always done by the same group. They found that 20% of the 10,000 children reacted to the tuberculin test. At a test in one community we obtained permission to apply the tuberculin test on all the children in the rural town and found that 14% of these children reacted to the test.

In my work at the sanatorium I have followed cases in children with the X-ray from year to year to see if the deposits that we considered tuberculous disappeared. I think where they are well defined, with glands surrounded by fibrous tissue, these areas of tuberculosis will often disappear. Whenever calcification goes on these foci will persist.

Another thing I have been interested in watching is the incidence of tuberculosis in children. Pleural effusion is quite common. I cannot help but feel that pulmonary tuberculosis is secondary to childhood infection. Of course we get comparatively few children with pulmonary tuberculosis. Last year, as I remember it, 26 out of 10,000 children showed definite pulmonary involvement. It is not uncommon to find in these cases that there are dense primary tubercular lesions in the apices.

I would say to Dr. Krause that we are planning to examine the children in Framingham and that we are planning to do it this year. I would like to ask him if it would be better to defer this work for another year. In our ordinary routine we would examine 15% of the school population. I think possibly with the cooperation of the National Tuberculosis Association we will be able to get a large number of those children who were tested ten years ago to supplement the ones which we would get out of our routine examination.

The death rate in 1918 was 136 per 100,000. Last year, 1925, the death rate was only 69.5 per 100,000 population. For the last few years the death rate for children from tuberculosis has dropped 3.4% each year. It seems reasonable to suppose that the present death rate, about 70%, could be cut in half in another ten years if the same impetus goes on. I feel that the examination of these school children calls attention to the fact that those who are malnourished are more apt to develop tuberculosis. It is possible to build them up by teaching the parents of the children how to look after their condition, etc.

DR. KRAUSE (In closing): In answer to Dr. Chadwick's question, I think it would be better to wait as long as possible before conducting a similar study, i.e., two or three years. As I remember it, the Framingham study was done in 1919 or 1920. I think we might very well begin collecting figures over a period of one to four or five to six years and see if they come near the figures that he obtained in 1920.

Case Records of the Massachusetts General Hospital

ANTE-MORTEM AND POST-MORTEM RECORDS AS USED IN WEEKLY CLINICO-PATHOLOGICAL EXERCISES

EDITED BY
RICHARD C. CABOT, M.D., AND HUGH CABOT, M.D.
F. M. PAINTER, A.B., ASSISTANT EDITOR

CASE 12251

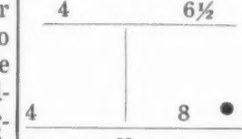
DIZZINESS; CAUSE?

MEDICAL DEPARTMENT

An English cotton mill operative sixty-five years old entered February 26 complaining of dyspnea of nine months' duration. His father died at sixty-one of "shock", his mother at sixty-two of gangrene of the foot. A brother fifty-two years of age had a condition said to be the same as the patient's. His first wife died after a difficult labor. The child was stillborn. His second wife had never been pregnant. He had scarlet fever in childhood, "typhoid-pneumonia" and gonorrhea at thirty-five. At sixty he was in bed six weeks with pains in the gluteal and sacral regions. At sixty-two he was ill two weeks with "influenza", —severe headache and fever. For several years it had been an ordeal for him to climb the three flights of stairs to his work. For two years he had been doing the work of two men. Until the present illness he had always considered himself well and strong.

For many years he had had chronic cough, usually dry, sometimes with a little whitish frothy sputum. In June, nine months before admission, on walking up a hill he noticed that he was very short of breath and was obliged to rest ten minutes after he reached the top. The next morning on bending over he suddenly became very dizzy and fell, making a severe gash along his nose which kept him at home for three weeks. Three weeks after this accident he had another attack of vertigo while sitting quietly smoking after a hearty dinner. A month after his first attack of vertigo he attempted to go back to work, but was obliged to give it up on account of dyspnea, and never tried it again. During the summer he managed to go about a little. By September however the dyspnea had become so severe that he was confined to bed or a chair. The least exertion forced him to stop and rest. Recently he could hardly get enough breath when sitting upright in an arm chair. Since the first of September he had been under medical care. The brown pills given made him worse and upset his stomach, so he had not taken them regularly. Since the onset of the illness he had increased the number of pillows from one to four. For the past month he had had edema of the ankles only. Since the onset he had had no more vertigo. He had had occasional nausea, with a feeling of discomfort in the epigastrium. The nausea he could always associate with the taking of the pills. The urine was always dark. He thought he had passed less than usual. Since the onset he had urinated twice every night. A year ago he weighed 199 pounds. He now weighed 177.

Examination showed a well nourished, grey haired man with loose skin and moderate dyspnea, slightly cyanotic. The teeth were false. The cervical, axillary and inguinal glands were slightly enlarged. The chest expansion was reduced. There were râles in the lower halves of both lungs posteriorly. The apex impulse of the heart was not seen or felt. There was marked enlargement to percussion (see diagram). A systolic and a diastolic murmur were heard over the precordia. The pulses were slow and forceful. The veins in the neck were distended. The blood pressure was 170/92-168/67-162/88. The artery walls were palpable and tortuous. Electrocardiogram showed probable partial auriculoventricular block 2:1; auricular rate 70, ventricular 35. Intraventricular block. P-R interval .22 seconds. The liver was moderately enlarged. The edge was felt. There was no marked ascites. The veins over the right scrotum were markedly enlarged. There was slight pitting edema of the ankles. The legs, especially the right, showed varicose veins. Rectal examination showed internal and external hemorrhoids. (The patient was unaware of these until the examination.) The prostate was essentially normal. The left pupil was greater than the right; both were regular and reacted normally. The knee-jerks and ankle-jerks were normal.



The urine was normal in amount, cloudy at one of four examinations, specific gravity 1.024-1.016, a large trace of albumin at all examinations, rare to occasional leucocytes at two, rare red cells at one. Renal function 10, 25 and 5 per cent. Blood examination showed 8,750 to 11,250 leucocytes, 69 per cent. polynuclears, hemoglobin 70 per cent., 4,600,000 reds. Wassermann negative. Non-protein nitrogen 35 mgm. Vital capacity 1,000 (three tests). Blood culture: streptococcus hemolyticus, both flasks. Throat culture negative. Sputum (Smith stain): a small amount of bloody mucoid sputum, not characteristic of any chronic process, probably passive congestion.

Report of heart consultant. ". . . . The blocked auricular contractions are easily heard following the second heart sounds and at the lower end of the sternum. Cheyne-Stokes respiration. Poor prognosis. It would be of in-

terest to see if the ventricular heart rate could be increased by barium chloride gr. ss every four hours. Increase in heart rate may improve condition. History suggests Stokes-Adams attacks. Digitalis, which is indicated for his congestive failure, may increase the rate of block and cause further attacks, but it is worth trying if barium chloride is ineffectual or not tried. Sometimes digitalis by improving the cardiac contraction, and thereby probably the coronary circulation, has been known to decrease the grade of block. Atropin will probably be ineffectual."

The temperature was 98° to 102.2°, intermittent, the pulse 36 to 52, the respiration 25 to 59.

February 27 the patient was started on atropin gr. 1/100 by mouth 4 i.d. It was ineffectual. March 3 barium chloride gr. 1/6 4 i.d. was started. March 4 the visiting physician found no evidence of increased supracardiac dullness. He heard a systolic murmur at the apex and the base; no diastolic murmur. March 6 the barium chloride was stopped and digifolin gr. vi given intramuscularly, with an order for digitalis leaves gr. iii t.i.d. March 8 the patient died.

Discussion

BY RICHARD C. CABOT, M.D.

NOTES ON THE HISTORY

1. Here is a family in which one member dies apparently of cerebral arteriosclerosis and another of peripheral arteriosclerosis, and the patient has short breath of a type that may well be due to the same sort of condition in the cardiovascular system. Without making that diagnosis I think it should be a loosely held hypothesis in the back of our minds.

2. "The child was stillborn" is in relation to the question of syphilis. But after a difficult labor the child is often stillborn, so I infer nothing from that.

3. "Typhoid-pneumonia" of course is not a disease at all, but a misnomer.

4. From the first sentences I infer nothing. There is nothing that lasts long enough to have importance in the present trouble. These things therefore have no value to me.

5. "For several years it had been an ordeal for him to climb the three flights of stairs to his work" is the first definite fact to me.

6. This history brings up the subject of the symptom of dizziness, vertigo. In the first place, vertigo that makes a person fall is one thing, and vertigo that does not make a person fall is another thing. Unless the person falls or comes near falling we need not pay much attention to the vertigo. The same word, dizziness, is often associated with something so slight, with something so neurasthenic, that we do not consider it important. Supposing they do fall, supposing we know that they have real vertigo, the first thing that calls to mind is ear trouble. Ear trouble is what we find in the vast majority of cases when a person is tortured with dizziness of that type. What prognosis can we give? Is it going on as long as he lives? No. It is going to get well as he gets deafer. He is going to lose his dizziness as he loses his hearing. I have learned this after many years of observation. Now I can say to patients, "I cannot do one thing for you and I do not believe anyone can, but nature will cure that vertigo." Usually, however, getting well coincides with getting deafer.

7. In this case the dizziness is probably due to some more definite brain lesion. Of course, although I have mentioned the most common cause of dizziness, it can be due to whatever causes one to faint. All the cases of fainting are cases of vertigo, and all the cases of true vertigo are cases of fainting. Circulatory trouble as well as ear trouble can give fainting and vertigo.

8. The march of symptoms here is interesting. First he is short of breath on exertion. Next he is short of breath unless he keeps still. Then he is short of breath even when he keeps still.

9. The brown pills were I suppose digitalis, which often does upset the stomach. It is perfectly right to give it, but apparently it did not help.

10. It is often a good question to ask people: "How many pillows do you use at night?" At the beginning of dyspnea they will say two, then three, then four. He had had dyspnea for months, yet his edema only one month.

11. It is probable, if he has heart trouble as we think, that he has passive congestion of the kidneys and so a diminished amount of urine.

12. The loss in weight is surprising. I should expect him to gain weight with edema. We hate to see patients with this trouble gain weight, and they ordinarily do.

13. What are we expecting to find, in a general way? Heart trouble. What sort? At his age, he having been well up to sixty, the hypertensive type, the type that goes with arteriosclerosis often but that occurs without arteriosclerosis, and of which all we know is that we get a weak heart and a big pulse pressure.

NOTES ON THE PHYSICAL EXAMINATION

1. We put many of these things down as a matter of routine physical examination. They do not mean anything.

2. There are times when we cannot get the apex beat in an elderly person, but we can often get the information from blood pressure measurements.

3. There is *apparently* a tremendous transverse dullness at the region of the second rib—ten and a half cm.—which is almost twice the

normal. I conclude from that that he has an aneurysm, or that he has a tumor in his chest, or (which is much more likely than either) that somebody percussed it wrong. If it is right he has either an aneurysm or a tumor in his chest.

4. I am a little surprised that there is no arrhythmia.

5. The blood pressure shows two points,—a high systolic and a low diastolic, i. e., a big pulse pressure, which might be due to aortic regurgitation, but which might also be due to arteriosclerosis alone, which will give as large pulse pressure as that, without any aortic regurgitation or anything else wrong with the heart.

6. The P-R interval is practically normal,—a trifling prolongation.

7. There is probably congestion of the liver.

8. I cannot infer from this renal function any kidney disease. It is perfectly compatible with kidney disease, but also compatible with simple passive congestion of the kidney. They did it three times. Once it was only five per cent. in two hours. Years ago, before I had had so many cases just like this, I should have said that certainly meant chronic nephritis. But I have said that sometimes, and Dr. Richardson has refused to back me up.

A PHYSICIAN: Would a man with that function be fit for an operation?

DR. CABOT: No. He would not be fit for operation; but he would not necessarily have any kidney trouble. He might be unfit for operation because of his heart trouble. I am not saying that he has nothing wrong with his kidney, but what I do say is that save for congestion he might have a normal kidney, and we may find yet that he has a normal kidney and yet has that low renal function.

9. There is a slight leucocytosis. It is a practically normal blood. The non-protein nitrogen is normal. That is a point against nephritis. The vital capacity is about what we should expect in a man whose lungs are blocked up by edema.

10. The blood culture is entirely unexpected to me.

11. Let us see what we think before we read the report of the heart consultant. With this diastolic murmur, with heart block, with a high blood pressure and a big pulse pressure, with streptococcus in the blood, I should think the chances were that he had an acute endocarditis on top of an old hypertensive heart trouble. These dizzy attacks may have been Stokes-Adams attacks, that is, attacks in which the heart stops and the patient loses consciousness or comes near it.

12. In general digitalis tends to increase the grade of block, so we are always afraid to give it in a case of heart block.

13. The chart runs the way we should expect it with a bad infection on the heart valves or somewhere else.

14. I was skeptical about the supracardiac dullness. Apparently the visiting physician is skeptical about it too.

DIFFERENTIAL DIAGNOSIS

This is a difficult case because we have such contradictory findings. One time we have a diastolic murmur and one time we do not. On the whole, I believe the man who said he did not hear any. The first examination is likely to be the house officer's examination. The second is likely to be better. On the chances I think we had better not say anything about a diastolic murmur or try to infer from it. I should have less difficulty about the case if it were not for the positive blood culture. But that does bother me. Of course that need not have any connection with the heart. But I think it is safer to assume that there is acute endocarditis. If so where? I do not know. There is nothing that tells us where it is. It is just as likely to be the aortic valve as the mitral.

I think this man has had for years hypertension. I think his heart has been hypertrophied and dilated. I think he was going to die of that anyway, and I think on top of that he got this acute infection in his heart,—the streptococcus hemolyticus, not viridans. The streptococcus viridans is what we expect. The hemolyticus is what we do not expect. We have no evidence of any local lesion from which that hemolyticus should have been absorbed into the blood, no evidence of an abscess anywhere; so I am puzzled by that.

I think the best we can say is a hypertrophied and dilated heart with no chronic valve lesion but with some acute endocarditis probably, on which valve I do not know; passive congestion of the lungs, liver, and presumably of the other organs of which we do not get any definite knowledge.

Did he have anything in his brain? I do not believe it. Will anything be shown in the bundle of His? I do not believe it. He might have fibrous tissue, a fibrous myocarditis involving the bundle of His. Fibrous myocarditis is one of the things we have to consider as a possibility here, though we can never diagnose it.

I think he will have arteriosclerosis, because most people of his age do, because it is generally associated with hypertension, and because his peripheral arteries were sclerosed. I see no reason to think that his brain or gastro-intestinal system will show any lesions.

A PHYSICIAN: How long did this infection last?

DR. CABOT: I do not know. The chart is the chief indication. The chart was pretty nearly normal for the first few days. It was up from the 2d to the 8th, so it seems like a terminal infection.

A PHYSICIAN: There is no mention of the character of the death.

MISS PAINTER: There is no record except that he was put on the danger list on the 6th and died on the 8th.

DR. CABOT: We do not know anything about it.

A PHYSICIAN: There is a long history of dyspnea. Would you consider an adherent pericardium?

DR. CABOT: That is always a possibility, but never a diagnosis that we can make. At his age the commonest cause of death is hypertension. That would be the cause in ninety-nine cases out of a hundred. In the hundredth it might be pericarditis, but we cannot make that diagnosis.

A PHYSICIAN: Is it not unusual to have a practically normal non-protein nitrogen with such a poor kidney function?

DR. CABOT: No, it is not. That is what we get in passive congestion of the kidney. I do not believe they will find nephritis. I think they will find arteriosclerosis in the whole body, including the kidney, but no nephritis. The evidence is that he never had anything that I can call uremia, that he had low non-protein nitrogen, and the specific gravity of the urine was never low.

A PHYSICIAN: Would you think of a low grade pneumonia as a terminal factor?

DR. CABOT: It is perfectly possible. I am glad you spoke of it.

A PHYSICIAN: Would you think of the prostate as of any consequence? We have a retention.

DR. CABOT: I think the prostate is all right.

A PHYSICIAN: The specific gravity range is high. That would rather indicate no nephritis.

DR. CABOT: Yes. In other words the kidneys could concentrate urine and there is no reason to suppose his gravity is fixed. Those two things are as important as anything I know against nephritis.

A PHYSICIAN: What per cent. of albumin is a large trace?

DR. CABOT: When we take some urine and put it in a wine glass and pour some cold nitric acid under it, the zone is about a sixteenth of an inch thick and rather dense. That is "a large trace". We have no accurate methods of measuring albumin, and we do not need them, because we do not need to know the exact amount of albumin. We may have a great deal of albumin in a case that has no nephritis, and none at all in a case that has nephritis. So I cannot get up any enthusiasm about quantitative measurements of albumin.

I think Dr. Richardson will tell us this man has a hypertrophied and dilated heart. I think, but I do not feel very sure, that he has some acute endocarditis on the mitral or aortic valve; moderate arteriosclerosis; passive congestion of the lungs, liver, and presumably of the other organs, though I have no evidence on that. I shall not be surprised if Dr. Richardson finds pericarditis and adherent pericardium, but I do not see any evidence of it.

CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Arteriosclerotic and hypertensive heart disease.
Heart block—myocardial insufficiency.

DR. RICHARD C. CABOT'S DIAGNOSIS

Primary hypertension.
Acute streptococcus hemolyticus endocarditis.
Passive congestion of the lungs, liver and presumably of the other organs.
Possibly fibrous myocarditis.
Moderate arteriosclerosis, general.

ANATOMICAL DIAGNOSIS

1. *Primary fatal lesion*

Septicemia, streptococcus hemolyticus.
Arteriosclerosis of the mitral and aortic valves with extension of the process into the region of the bundle of His (heart block 2:1).
Hypertrophy and dilatation of the heart.

2. *Secondary or terminal lesions*

Arteriosclerosis.
Chronic passive congestion, general.
Hypostatic pneumonia, lower lobe of right lung.
Serofibrinous pleuritis.
Slight hydropericardium.
Beginning ascites.

3. *Historical landmarks*

Obsolete tuberculosis of the mesenteric glands.

DR. RICHARDSON: There was a streptococcus hemolyticus infection. He did not have any endocarditis. He had well marked arteriosclerosis, more especially in the arch, the descending thoracic, and the abdomen aorta. The heart weighed 750 grams. It goes without saying that it was a markedly hypertrophied heart.

DR. CABOT: What would a normal heart in a man of his age weigh?

DR. RICHARDSON: 300 to 350 grams.

DR. CABOT: So it is over twice the normal size.

DR. RICHARDSON: Yes. The interesting thing in the heart, besides the hypertrophy and dilatation, was the valves. There was marked fibrocalcareous degeneration in the mitral valve in the shape of a fibrocalcareous column that extended over into the region of the bundle of His. In the aortic cusps there was also a certain amount of fibrocalcareous change of the arteriosclerotic type. A hypertensive heart

then with arteriosclerosis and arteriosclerotic changes in the valves, with extension of the mitral process across to the bundle of His, giving what they called 2:1 block.

DR. CABOT: Would you say a word more about the arteriosclerotic changes in the valves? You do not mean deformity?

DR. RICHARDSON: There is some deformity of the aortic cusps, but not such as we find in chronic endocarditis, where the cusps are fused into smaller and larger masses with marked reduction of the orifice. But it consists of thicker and thinner fibrocalcareous plates and plaques similar in all respects to those that we find in arteriosclerotic aortae, and so we call the condition arteriosclerosis. In regard to the mitral valve, the process there seems to take the shape of a fibrocalcareous column skirting along beneath the curtain, and there are no irregularities on the curtain surface except those due to the impingement of the irregular calcareous material running along underneath it. In chronic endocarditis the thrombi gather on the surface and it is rough, irregular, and according to the stage of the endocarditis it is firm or else soft, mushy, and microscopically shows bacteria in the acute cases.

DR. CABOT: Do you think these valves worked all right?

DR. RICHARDSON: I should think there would be some interference with their functioning.

There was of course chronic passive congestion of the lungs, and in one of the lower lobes some hypostatic pneumonia. The passive congestion was rather slight in the liver, fairly well marked in the spleen, and very slight in the kidneys. The kidneys were very good organs. As necropsies come and go the kidney is an organ which seems to stand the wear and tear of life about as well as any organ.

DR. CABOT: I would call attention to the fact that these were good kidneys in spite of the five per cent. function.

I still believe it was hypertensive, but Dr. Richardson thinks there may have been some aortic regurgitation too. I ruled the other way on that so far as I could say anything about it. I am surprised that there should be no endocarditis, because no other localization of the infection was found. I guess it was terminal, just those last days. The body goes down, down, in its powers of resistance, and then some of these organisms swim in from the intestinal or the genital tract and set up a terminal septicemia.

Did he have any chronic pericarditis?

DR. RICHARDSON: No.

A PHYSICIAN: Is the condition of his kidneys due to poor circulation?

DR. CABOT: Yes, that is it.

(Illustrations showing the heart in this case will be published next week following Case 11263.)

CASE 12252

THE CORRECT DIAGNOSIS OF VENEREAL DISEASE

SOUTH MEDICAL DEPARTMENT

An Italian-American truck driver twenty-two years old was referred by Dr. Siegel of Revere to the Out-Patient Department May 13 with a diagnosis of gonorrheal urethritis. The patient stated that exposure was on April 5 last. A red pimple appeared on the dorsum of the glans five days before admission. The patient squeezed it, found some clear fluid oozing out from it, and applied iodine.

Examination showed a single non-indurated oval crusted lesion about one-eighth of an inch wide by a quarter of an inch long. The inguinal glands on the right were enlarged, discrete, not tender. The overlying skin was not reddened or adherent to the glands.

The patient was referred to Ward G.

On admission to the ward May 14 he gave the following additional history. Under treatment for gonorrhea the discharge stopped a week before admission. He had had no other symptoms except the sore on the glans penis.

His past history was negative. He drank about half of a gallon of wine a week and smoked twenty or thirty cigarettes a day.

Examination showed a well nourished young man, comfortable and alert. There was scattered acne over the upper back. The teeth were ill-kept. There was pyorrhea. There were chains of enlarged glands in the posterior cervical triangles and enlarged glands in both groins. Over the dorsum of the glans penis a little to the right of the median line was an erosion about 3 mm. in diameter. This lesion was not indurated.

The chart was normal. The urine is not recorded. Blood examination showed 80 per cent. hemoglobin, 10,500 leucocytes. A Wassermann was negative.

By May 17 the genital lesion was nearly healed. That day he was discharged to the Out-Patient Department.

DISCUSSION

BY HENRY D. LLOYD, M.D.

The second paragraph hardly does justice to the lesion. As I saw it in the Out-Patient Department the dimensions were really more linear than the published description would indicate, and my first glance at it gave me the impression that the patient had a scabetic lesion there. Then when I came to palpate the glands in the groin I rather doubted whether it was scabies, and the patient was referred to Ward G. We purposely omitted from this summary the fact that as is our invariable custom a dark field was done before the patient was sent to Ward G, and that the treponemata pallida were

found. They were few in number. We considered that we were fortunate to find any after the application of iodine. Any antiseptic of such power as iodine usually causes the treponemata to seek the lower tissue levels where they cannot be found by dark field examination.

It is not often that we are fortunate enough to have a patient sent to us as this young man was, who has been under skilled observation. The fact that he was under skilled observation makes it reasonably certain that the incubation period is fairly accurate, and from April 5th to May 13th gives an incubation period of thirty-eight days. That for the primary sore of lues is quite a little longer than one would expect, the usual incubation period being from three to four weeks.

This acne was typical. There was no question about its being a syphilitic secondary rash.

At this point I would like to say there was a difference of opinion between the house officer and myself. I have changed his record a little for the purpose of the published statement He stated that there was induration. I palpated the lesion carefully with a gloved hand and could not convince myself that there was any induration there.

The negative Wassermann one would expect. The earliest recorded positive Wassermann that I know of is chronicled by Craig and is at the end of five days after the appearance of the primary lesion. But even Craig records only one such instance. There are about fifty per cent. of the Wassermann reactions which are positive at the end of two weeks, and from two to four weeks after the appearance of the primary lesion that percentage of fifty gradually rises to one hundred per cent.

The day after this patient came to the Out-Patient Department he was given four decigrams of diarsenol. He was perfectly willing to enter the hospital, but desired to make some arrangements before entrance. So we gave him permission to stay out of the hospital until the next day.

FURTHER HISTORY

0.4 gm. of diarsenol was administered intravenously May 13 in the Out-Patient Department.

Orders: Syphilitic precautions. 0.4 gm. diarsenol May 14 and every four days thereafter. Mercurial ointment to the penile lesion daily, morning and night. House diet. Fluids ad libitum.

FURTHER DISCUSSION

The opinion as to treatment is that in these very early cases which are sero-negative it is distinctly worth while to try the abortive treatment, and for that reason this patient was given a second injection of arsphenamin four days later and the results are indicated by the statement in the House history that the lesion was nearly healed. Reference to the Out-Patient record shows that at the end of another four days he received a third injection, and he will be in the Out-Patient Department tomorrow to receive a fourth injection.

The reason for my desire to discuss such a comparatively simple case is that if this patient had not been under skilled observation he presumably would not have come so early and would not present such a good prognosis. Also because the appearance of the lesion itself on the glans penis was exceedingly misleading. It is true it was a single lesion, which is usual in syphilis, but there was no induration. The crust was rather heaped up and was linear in form, and without the aid of the dark field, the Wassermann being negative, it would have been exceedingly easy to make a wrong diagnosis. The glands in the posterior cervical triangles which were noted at the time of entrance must have dated back to some previous infection, as generally glandular enlargement does not occur until at about the time of the outbreak of the secondary rash.

DIAGNOSIS

Primary syphilis.

CASE 12253

A PROBLEM IN DIAGNOSIS OF A RIGHT ABDOMINAL LESION

SURGICAL DEPARTMENT

A Russian Jew twenty-five years old entered April 16 complaining of pain in the right side and vomiting. Six years before admission he had gonorrhea with recovery. He had occasional headaches. He had had an operation on his nose, possibly on the septum. Otherwise his past history was negative.

Two years before admission he began to have attacks of burning pain across the abdomen at the level of the umbilicus and to be troubled with gas after nearly every meal. The attacks of pain occurred once in a month or two and lasted from a few seconds to a few hours. The last of these attacks occurred a year ago. Gas pain started in the region of the umbilicus, passed up, and gave him a feeling of pressure in the chest. The belching of a fair amount of gas gave relief. The night before admission he began to have severe aching pain in the right side at about the level of the umbilicus, starting abruptly about fifteen minutes after supper. At times this was severe enough to double him up. It kept him awake all night. From the onset of this he was nauseated. He vomited "all night". First he vomited his supper, afterwards clear material, at first green, the last few times yellow. His bowels were not constipated. Three enemas the night before admission gave

good results but did not relieve the pain. At admission it was no better or worse than the night before. He thought he had not lost weight.

Examination showed a well nourished man looking ill, vomiting in paroxysms, and complaining of abdominal pain, more marked in the epigastrium and the mid-right quadrant. The heart and lungs were normal. The abdominal walls moved freely. There was no obvious distension. Occupying the right middle quadrant was a smooth, sausage-shaped, not especially tender mass which did not seem to move with respiration but ran parallel to the ascending colon and was lost under the costal margin. There was also some epigastric tenderness and muscle spasm, but no real rigidity. The rest of the examination was negative.

Before operation the urine was normal in amount, specific gravity 1.012 to 1.020. The sediment showed no leucocytes to three leucocytes per high power field. Blood examination showed 16,200 to 6,100 leucocytes, 74 per cent. polynuclears, 85 per cent. hemoglobin, reds 5,300,000, no achromia, platelets diminished. Two Wassermanns were strongly positive. The stools gave a positive guaiac at all of three examinations, twice strongly positive.

A Graham test was rather unsatisfactory because the patient was unable to suspend respiration. There was a shadow of increased density visible in the gall-bladder region which probably represented the gall-bladder, apparently containing a moderate amount of dye. The outline, however, was rather indistinct because of motion. The shadow was not seen after the patient took food. The findings were rather inconclusive.

Lumbar puncture in the second to third lumbar space gave 10 c.c. of clear colorless fluid, initial pressure 150, jugular pressure normal, after withdrawal of 5 c.c. pressure 70, after withdrawal of 10 c.c. zero; no cells; alcohol and ammonium sulphate negative, total protein 32, goldsol 0000000000, Wassermann negative.

April 16 a surgical consultant did not think the case was urgent at present but advised operation in case of increase of symptoms.

The day of admission the temperature was 97° to 100.2°; afterwards it was 97.4° to 99.3° until operation. The pulse before operation was 60 to 100, the respiration 19 to 30.

The right upper quadrant rigidity, muscle spasm and tenderness with questionable mass were still present April 18. The temperature was 99°-100°, the leucocyte count 16,000. The patient was allowed a liquid diet. From the 19th he was symptom free. April 23 another surgeon advised operation in view of the probable recurrence.

April 25 operation was done. The patient made a fairly good recovery. He had some gas pains and was still rather uncomfortable May 2. The rubber wick was replaced by a Miller wick. After this the convalescence was uneventful. May 4 another Wassermann was strongly positive. May 11 he was discharged relieved.

Discussion

BY HORACE K. SOWLES, M.D.

I suppose the note about weight has reference to the last two years of history.

The leucocyte count shows a diminishing inflammatory reaction, also indicated by the percentage of polynuclears.

Probably the reason they did a lumbar puncture was because of the history of positive Wassermann and epigastric or central abdominal pain, to rule out crises which might occur in tabes. But the Wassermann on the spinal fluid was negative. In a questionable gall-bladder or liver condition there are certain conditions in the liver which will give a positive Wassermann. I suppose that is why the Wassermann was repeated here.

The convalescence after operation was uneventful.

The reason we chose a case of this type was to show the difficulty in arriving at a positive diagnosis in ordinary abdominal lesions. I think in this case of course that gastric crisis is not a very likely diagnosis anyhow, and that was ruled out by the lumbar puncture. Then we come down to two diagnoses, either gall-bladder pathology or acute appendicitis. In favor of gall-bladder pathology is the fact that the pain has a tendency to radiate upward rather than downward, and that he has some digestive disturbance along with his attacks in his past history. On the other hand several consultants expressed the opinion that it was impossible either from his history or from his physical examination after he came into the hospital to say whether or not the trouble was in the appendix or in the gall-bladder, and that to make a positive diagnosis would be mere guesswork. I saw the case, and personally I put the diagnosis appendicitis, merely on the theory of chances.

A Physician: What is the Graham test?

Dr. Sowles: The Graham test is the injection of sodium tetraiodophenolphthalein. It can be given either intravenously or by mouth, will be secreted by the biliary system, and on X-ray examination will show an increased density of the gall-bladder shadow. If it is positive I think it is of some real value.

A Physician: As indicating a biliary lesion or some sort?

Dr. Sowles: Yes; and we get variations in outline of gall-bladder and outline of stones, etc. I do not feel that a negative Graham test has much value. Another thing about it, from the little I know, is that they do it on the medical side and a great many patients get rather

severe reactions from the drug itself, nausea, vomiting, etc. In this case the Graham test was inconclusive.

Miss Painter: We have had some cases where the test was negative and there were stones. The radiologists said the negative test is not conclusive.

A Surgeon: You referred to certain conditions in the liver as giving a positive Wassermann.

Dr. Sowles: There are certain liver disturbances which do occasionally give positive Wassermanns. I do not know enough about them to know what they are, but that was an opinion expressed by one of the medical consultants. He asked to have the Wassermann repeated for fear it might not be a true Wassermann due to syphilitic infection but to some liver disturbance.

So we came down to a diagnosis of subacute appendicitis or subacute cholecystitis.

PRE-OPERATIVE DIAGNOSIS

Subacute appendicitis or
Subacute cholecystitis.

OPERATION

A rather high right rectus incision. The appendix was definitely thickened, with subacute inflammation and several adhesions. It was removed without difficulty. Further examination showed a very large and distended gall-bladder which was removed without difficulty. It contained a large blood clot and several small stones.

PATHOLOGICAL REPORT

A large gall-bladder with a purplish-red surface and a smooth mucous surface with many small stones. Microscopic examination shows the walls thickened by fibrosis and infiltrated with fluid and wandering cells. There are many polynuclear leucocytes.

The appendix is 7.5 cm. long. Its surface is covered with inflammatory membrane and its walls are thickened.

Subacute cholecystitis.
Cholelithiasis.
Fibrous appendicitis.

Further Discussion

The incision was made with the idea of going in either direction, toward the appendix or toward the gall-bladder, as conditions indicated. When we opened the gall-bladder it contained a tremendous hematoma. It was full of hard blood clot and a lot of little stones. I do not know whether the Graham test could have anything to do with the hematoma in the gall-bladder or not. I never heard of irritation to that extent from the Graham test.

It was probably due to the rupture of some little blood vessel. That also would explain the blood in the stools, the positive guaiac. And undoubtedly that is what the house officer felt running down parallel to the colon at his first visit. I felt that same thing, but it was not tender, and I concluded it was the outer edge of the rectus muscle.

Dr. Camp, do you think there is anything in the Graham test which might be a sufficient irritation to make the gall-bladder fill with blood?

Dr. Camp: I have never heard of anything of that kind. We have had, I do not recall the exact number of cases, about one hundred of these Graham test cases operated upon. I do not know of any gall-bladder that showed definite signs of irritation that could be attributed to the Graham test, and I have heard no radiologist who has done any of the work speak of such a thing. I do not think it should irritate the gall-bladder to that extent. Of course in this particular case the examination was not really satisfactory because the patient would not suspend respiration. That is very important in all gall-bladder work, because the least motion will obscure some of the densest stones. In the Graham test, where we are depending on negative shadows, there may be enough motion to obscure the stones but not sufficient to obscure the gall-bladder. These stones are hard enough to show at best, and the least amount of motion makes the test practically worthless.

A Surgeon: What did the pancreas look like?

Dr. Sowles: Nothing abnormal. I was perfectly satisfied at the time of operation that there was enough in the appendix to account for all his trouble. It was thickened and tied down by adhesions. I felt of that first and thought that was enough to account for his trouble. Then I thought I had better feel of the gall-bladder before I left, and found this tremendous gall-bladder. I thought clinically it was at least a subacute appendicitis.

DIAGNOSIS

Subacute cholecystitis.
Cholelithiasis.
Subacute appendicitis.

THE BOSTON
Medical and Surgical Journal

Established in 1828

Published by The Massachusetts Medical Society under the jurisdiction of the following-named committee:

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Subscription Terms: *$6.00 per year in advance, postage paid for the United States, $7.56 per year for all foreign countries belonging to the Postal Union.*

Material for early publication should be received not later than noon on Saturday. Orders for reprints must be sent to the Journal office, 126 Massachusetts Ave.

The Journal does not hold itself responsible for statements made by any contributor.

Communications should be addressed to The Boston Medical and Surgical Journal, 126 Massachusetts Ave., Boston, Mass.

THE QUESTION OF DISINFECTION

Medical views change and opinions which have been regarded as unassailable are nowadays not infrequently consigned to the scrap heap. Some of the more modern views are doubtless good while, on the other hand, some of the old ideas which the younger generation wish to discard wholly should be subjected to a further consideration before being dismissed pre-emptorily as useless.

Among these latter new ideas disinfection is one which may be further considered.

Not many years ago, if a sanitarian or hygienist had suggested that disinfection was of little or no use and should be abolished he would have been regarded as more or less of a madman. After, and as a consequence of, the germ discoveries of Pasteur, for many years it was an article of faith with epidemiologists and sanitarians that to avoid the spread of contagion disinfection was essential. In fact, as all infection was looked upon then as spread by germs it was only logical to believe in the efficacy of a means of prevention which would destroy or minimize the potentialities of these agents for evil. Then the significance of the "carrier" came into prominence, mainly through the publication of the work of Park and Beebe. Later yet other modes of infection seemed to be suggested.

It was in this country that the gauntlet against disinfection was first thrown down. As long ago as 1905 Dr. C. V. Chapin, Medical Officer of Health for Providence, Rhode Island, gave up terminal disinfection for scarlet fever and diphtheria. His views were received at first with caution by the majority of his coworkers in public health, but as the consequences of this contravention of existing views were without incident the consensus of opinion now in this country seems to be that disinfection is largely a waste of time, and unnecessary expenditure of energy.

In more conservative Great Britain belief in the virtues of this method of controlling certain diseases has been much longer in dying and indeed is not dead yet. But the tendency of the younger exponents of preventive medicine is towards scepticism of the value of disinfection. In Germany also a similar tendency prevails.

However, although it appears to be becoming the vogue among the younger school of sanitarians to deny the merits of disinfection, in Great Britain there are many staunch upholders of the method. Among these Dr. H. R. Kenwood, Chadwick Professor of Hygiene in the University of London, who contributes a special article on the subject of disinfectants and sickroom disinfection to the *Lancet*, May 29, 1926. Professor Kenwood believes stoutly in scientific disinfection and is doubtful if the modern views of the uselessness of disinfection of rooms and their contents after scarlet fever and diphtheria are correct. At any rate, he is of the opinion that a prolonged inquiry is necessary to get at the truth, which is elusive and difficult to arrive at, and that the inquiry must embrace many very carefully ascertained facts. He goes on to point out that all those who have studied with an open mind the rather crude observations which have been published will agree that it is impossible at the present day to come to any safe conclusion upon the problem which they seek to solve; and that in the meantime we are not justified in denying to the public a measure of probable protection.

In commenting upon Professor Kenwood's article the *Lancet*, May 29, has an editorial in which it is said that in the home treatment of scarlet fever assiduous concurrent disinfection, however simple in character, is required. And the editorial in question draws further attention to the fact that it should be made quite clear that the failure of disinfection to stop the spread of air borne infections does not belittle the part it has taken in the suppression of the diseases communicated by the alimentary route or by inoculation.

Fumigation, too, in ships, for the destruction of vermin, the rat and the flea, as a protection against plague and perhaps other diseases

is gaining ground with many port sanitary authorities.

To sum up, American health authorities, as a rule, perhaps, disbelieve in the efficacy of disinfection. The younger exponents of preventive medicine certainly so disbelieve. In Great Britain the health authorities are more conservative, and while the younger section may be for the most part sceptical as to its value, health authorities in Great Britain generally seem to think that it is the injudicious employment of disinfection only which has brought discredit on the measure and that when used properly it is of the first value. It might be interesting to have the matter discussed at length, by the supporters of opposing views. If immunization against scarlet fever and diphtheria is to take the place of disinfection at home and in schools the public must be educated so as to understand that the measures to which they have been accustomed so long are useless or comparatively useless. The question should be ventilated thoroughly as it is of the first importance.

THE APPOINTMENT OF DR. F. X. MAHONEY

With the election of His Honor, the Mayor of Boston, one of the major responsibilities relating to city government was found to lie in the appointment of the Commissioner of Health. His Honor had to consider the views and wishes of many of his constituents. Some felt that the too common custom of recognizing political influence in the appointment of heads of departments should be observed, but a very considerable number of citizens, including prominent physicians, have been convinced that the position of a health commissioner should not be made a political football to be played with to the advantage of any of those organizations more concerned in the interest of political parties than in the health of the community. This seemed an opportune time to urge the elimination of political pressure in this important appointment with the hope that future mayors will always feel free to follow this precedent.

Since the Boston Health Department has conducted its affairs creditably without the suspicion of scandal, it was logical to urge the reappointment of Dr. Francis X. Mahoney.

The Mayor, after due deliberation and conference with fair-minded citizens has seen fit to continue Dr. Mahoney as head of this department. We congratulate Dr. Mahoney on this endorsement of his work and expect that the City will continue to enjoy the benefits which will follow a wise and aggressive policy in dealing with the complex problems of a health department of a large city. We also congratulate His Honor, Mayor Nichols, on his independence and his endorsement of the policy of maintaining continuous tenure of office when it is for the advantage of the public.

SMALLPOX

The statistics for 1925 compiled from reports of health authorities of the United States, with the exception of Utah, show that there were 43,193 cases of smallpox in the United States in that year.

It was stated in the *New York Sun* in May, 1924, that only one country in the world has a worse record; that is India.

Even with the better living conditions here we are nearly as badly off as India. We ought to be ashamed of the conditions which place the United States next to the least well protected countries with respect to smallpox.

Of the New England States Rhode Island had nearly a hundred cases of smallpox in 1925, due, it is believed, to less general use of vaccination as compared with her sister states in this group.

The prevention of smallpox can be made absolute if vaccination is made universal. Some misguided people will continue to be obstructionists. Included in this class is the Massachusetts State Senate.

TWELFTH ANNUAL REPORT OF THE PETER BENT BRIGHAM HOSPITAL

The Annual Report of the Peter Bent Brigham Hospital differs from most hospital reports in that it provides a medium for the discussion of hospital problems rather than a tabulation of hospital statistics. Tables showing the yearly activities of the hospital, the cost of maintenance, and the pathological condition of patients admitted are indeed submitted, but the most interesting portion is found in the reports of the Chiefs of the Surgical and Medical Services.

Dr. Cushing, in his report, calls attention to the change which is taking place in some institutions in regard to the periods at which medical students and house officers should take up ward and out-patient work. Whereas formerly the tendency was to put the less experienced men in the Out Patient Department, it has now changed, so that men are first taught history taking and careful physical examination in the wards. They are put in the Out Patient Department later. This method is followed at the Peter Bent Brigham Hospital, the out-patients being under the direct supervision of senior Medical house officers and junior Surgical house officers. In the Out-door Department patients are now seen by appointment. This system has apparently resulted in a decrease in the number of patients admitted, and an increase in the number of visits. Dr. Cushing discusses also the question of single records vs separate house and out-patient records, and the matter of increasing the size of the hospital to meet increasing demands. He holds to the opinion that for good coöperation and unity in purpose a hospital should not be allowed to

grow to an unwieldy size; that several small hospitals are better than one large one.

Dr. Christian in his report refers to the addition of a third Visiting Physician—Dr. Cyrus C. Sturgis—and two Assistant Resident Physicians. More house officers are needed to care for the routine work. A Research Fund is also greatly needed. Dr. Christian deplores the too hasty purchase of research apparatus, and advises that research should be carried on with whatever particular outfit each hospital already has. Thus a problem will be approached in different hospitals from different angles. He describes the method employed at the Peter Bent Brigham Hospital to keep in touch with the patient's own physician. When the patient is admitted, his doctor is invited to attend a ward visit and join in the discussion of his case. The work of the special groups is outlined.

Particular items of interest gleaned from the Report show that in 1925 Dr. William deB. MacNider, Professor of Pharmacology at the University of North Carolina, served for one week as exchange visiting physician; Dr. Evarts Graham of Washington University, St. Louis, served as visiting surgeon. Dr. Harvey Cushing served as exchange professor at the University of Edinburgh. The X-ray Department, under Dr. Sosman, reports that by means of Cholecystography, the accuracy of radiological examinations of the gall bladder has increased from 20 to 93%, as shown by 600 trials. The Pathological Department reports that autopsies were done in 70.7% of all deaths. This excellent showing was due largely to the efforts of Dr. Burgess Gordon, who succeeded in bringing about a better coöperation with the morticians of the State, and secured from authoritative sources statements as to the harmony of the post-mortem examination with the tenets of the Jewish religion.

These are but a few of the interesting and suggestive subjects dealt with in this report of the Peter Bent Brigham Hospital. The report reflects the individuality of the institution and emphasizes its value as a factor in New England medicine.

THIS WEEK'S ISSUE

CONTAINS articles by the following named authors:

BLOTNER, HARRY, M.D. Tufts College Medical School 1924; Former House Officer, Eastern Maine General Hospital. Now Assistant Resident in the Peter Bent Brigham Hospital.

FITZ, REGINALD, A.B.; M.D. Harvard Medical School 1909; Associate Professor of Medicine, Harvard Medical School and Physician to the Peter Bent Brigham Hospital. The subject of their paper is "On Diabetic Gangrene, with Particular Reference to the Value of Insulin in Its Treatment," page 1155. The address of both authors is Peter Bent Brigham Hospital. Associated with him is

GREEN, HYMAN, A.B.; M.D. Harvard Medical School 1914; Assistant in Pediatrics, Harvard Medical School; Assistant Physician, Children's Hospital; Visiting Physician, Boston Floating Hospital, and

ROBBINS, GEORGE, M.D. Tufts Medical School 1924; Surgical House Officer, Boston City Hospital. They write on "Insulin in Infant Feeding," page 1162. Address Dr. Green at 483 Beacon St., Boston.

IRVING, FREDERICK C., A.B.; M.D. Harvard Medical School 1910; F.A.C.S.; Assistant Professor of Obstetrics, Harvard Medical School; Assistant Obstetrician, Boston Lying-in Hospital. His subject is "The Feeding of the New Born Infant from the Obstetrician's Point of View," page 1167. Address 475 Commonwealth Ave., Boston.

JORDAN, SARA M., A.B.; Ph.D.; M.D. Tufts College Medical School; Gastroenterologist to the Lahey Clinic; Deaconess Hospital; Visiting Physician, N. E. Baptist Hospital and N. E. Hospital for Women and Children. Her subject is "Habitual Vomiting, Inanition and Constipation in a Child Associated with Megacolon and Cured by Bowel Management," page 1168. Her address is 605 Commonwealth Ave., Boston.

GRIFFIN, WALTER A., A.B.; M.D. Harvard Medical School 1900; Assistant in Harvard Graduate School of Medicine; Member of the Climatological and Clinical Association and the Trudeau Society. His subject is "The Value of The Preventorium in Tuberculosis Work," page 1171. His address is Sharon, Mass.

KRAUSE, ALLEN K., M.D. Johns Hopkins University Medical Department 1907; Associate Professor of Medicine and Director of the Kenneth Dows Tuberculosis Research Laboratories, Johns Hopkins University; Physician in Charge, Tuberculosis Dispensary, Johns Hopkins Hospital; Editor, *American Review of Tuberculosis*, etc. His subject is "Remarks on the Decline of Mortality from Tuberculosis Among Infants and Children," page 1173. His address is Johns Hopkins Hospital, Baltimore, Md.

MISCELLANY

HONORS TO DR. JOSIAH P. BIXBY

A LONG life of service to humanity is worthy of especial mention. Such records are none too common and too often recognition of the unusual privilege of many years of cordial relations with associates is deferred to a post-mortem eulogy. The physicians of Woburn felt that they wanted Dr. Bixby to share in the cele-

bration of fifty years of honorable practice and met at the Unicorn Country Club on Wednesday evening, June second, 1926, for the purpose of extending congratulations and wishes for continued health and happiness.

A brief record of Dr. Bixby's life is as follows: He was born in Kenduskeag, Maine, in 1854; the son of a clergyman, and on his mother's side, the grandson of another clergyman. Dr. Bixby graduated from Phillips Andover Academy with the class of 1872 and then entered Bowdoin College. After graduating from the medical school of Maine in 1876 he practiced for a short time in New Salem and later moved to North Woburn where he successfully met the needs of the people for more than thirty-seven years. He is a retired Fellow of the Massachusetts Medical Society and served the Middlesex East Medical Society as President, 1899-1900. In addition to his professional activities he occupied a prominent position in his town, having served on the school board, the Board of Health, and as Clerk of the North Congregational Church. He has been active in the various activities of this religious body.

Winning the confidence of one's professional associates and of the community is a notable achievement and is a well earned investment which will bring comfort to Dr. Bixby during the years to come.

Dr. W. H. Kelleher presided over the exercises which were enjoyable in every detail.

CHANGE IN THE METHOD OF ADMITTING PATIENTS TO THE RUTLAND STATE SANATORIUM

THERE are now only about 100 beds at Rutland available for the care of patients other than those under contract for the Counties of Middlesex and Worcester, and the Tubercular Hospital District of Chelsea, Revere and Winthrop. These beds are to be reserved for adult patients of the most favorable type. It is therefore desirable that a uniform standard be used in selecting these patients, and for this reason the following plan will be followed:

Residents of Boston applying for admission to Rutland are to be referred to Dr. Cleaveland Floyd for examination at the Out-Patient Department of the Boston Sanatorium. Residents of sections of the State other than Boston, and the Counties of Middlesex and Worcester, and the Tubercular Hospital District of Chelsea, Revere and Winthrop (the cities of Worcester, Cambridge and Lowell are exempt from the provisions of the contract made by the counties in which they are located, and the same rule applies to them as to other sections of the State) are to be referred to one of the State Sanatoria or to the nearest Consultation Clinic which is conducted by the Sanatoria staff.

If a patient is found by one of these examiners to be a suitable case for admission the application will be approved and the name placed on the waiting list. The family physician is to fill out the application blank in the usual way and then send it with the patient to one of the 20 places listed below:

Boston Sanatorium, Out-Patient Department, rear 48 Rutland Street (South End). Mondays and Fridays, 10 to 11 A. M. (For residents of Boston only.)

Rutland State Sanatorium, Rutland, every day of the week (Saturdays, Sundays and holidays excepted) between the hours of 2 and 5 P. M.

North Reading State Sanatorium, North Wilmington. Between the hours of 2 and 5 P. M.

Lakeville State Sanatorium, Middleboro. Between the hours of 2 and 5 P. M.

Westfield State Sanatorium, Westfield. Between the hours of 2 and 5 P. M.

Worcester—O.-P. D., Worcester City Hospital, Chandler Street. First Wednesday of each month, 9 to 12 A. M. Consultants, Medical Staff of the Rutland State Sanatorium.

Gardner—Municipal Tuberculosis Dispensary, Municipal Building, 50 Glazier Street. Second Wednesday of each month, 2 to 5 P. M. Medical Staff of the Rutland State Sanatorium.

Framingham—Town Hall, Lexington Street. Third Wednesday of each month, 2 to 5 P. M. Medical Staff of the Rutland State Sanatorium.

Clinton—Municipal Tuberculosis Dispensary, Municipal Building. Fourth Wednesday of each month, 2 to 5 P. M. Medical Staff of the Rutland State Sanatorium.

Lowell — Municipal Tuberculosis Dispensary, City Hall. First Wednesday of each month, 2 to 5 P. M. Medical Staff of the North Reading State Sanatorium.

Lawrence—Municipal Tuberculosis Dispensary, City Hall. Second Wednesday of each month, 2 to 5 P. M. Medical Staff of the North Reading State Sanatorium.

Haverhill—Municipal Tuberculosis Dispensary, City Hall. Third Wednesday of each month, 2 to 5 P. M. Medical Staff of the North Reading State Sanatorium.

Woburn—Municipal Tuberculosis Dispensary, Board of Health Rooms. Fourth Wednesday of each month, 2 to 5 P. M. Medical Staff of the North Reading State Sanatorium.

Taunton — Municipal Tuberculosis Dispensary, City Hall. First Wednesday of each month, 2 to 5 P. M. Medical Staff of the Lakeville State Sanatorium.

Brockton—Municipal Tuberculosis Dispensary, Board of Health Office, City Hall. Second Wednesday of each month, 2 to 5 P. M. Medical Staff of the Lakeville State Sanatorium.

Fall River—Municipal Tuberculosis Dispensary, Purchase Street. Third Wednesday of each month, 2 to 5 P. M. Medical Staff of the Lakeville State Sanatorium.

Plymouth—Municipal Tuberculosis Dispensary, Room G, Governor Bradford Building, Town Square. Fourth Wednesday of each month, 2 to 5 P. M. Medical Staff of the Lakeville State Sanatorium.

Pittsfield—Municipal Tuberculosis Dispensary, House of Mercy Hospital. First Wednesday of each month, 2 to 5 P. M. Medical Staff of the Westfield State Sanatorium.

Holyoke — Municipal Tuberculosis Dispensary, City Hall Annex, Room 412. Third Wednesday of each month, 2 to 5 P. M. Medical Staff of the Westfield State Sanatorium.

Adams—Municipal Tuberculosis Dispensary, Greylock Bank Building. Fourth Wednesday of each month, 2 to 5 P. M. Medical Staff of the Westfield State Sanatorium.

ANOTHER SERVICE TO HUMANITY

HISTORY has repeatedly shown that whenever a need exists many persons have willingly endured suffering and danger in order to be of service to their fellow creatures. The latest example of this disposition is shown in the spirit of the seventy-five men who volunteered to subject themselves to inoculation of dengue by exposure to the ardos egypti mosquito.

While the information sought may not be as important as that acquired in the yellow fever experiments in Cuba it was attended with suffering and some danger to life. The demonstration of the cause of dengue under supervision of the army surgeons in the Philippines has added one more victory to scientific experimentation.

The *New York Times* submits the following comment in recording the achievement of the experiments:

"The anti-vivisectors should note that whenever necessary for the settlement of a question of this kind there never is any lack of men who volunteer to risk health and even life in the service of humanity. It is not so easy to die of dengue fever as it used to be of yellow fever, but the former is quite bad enough, and to chance it takes courage of the highest order."

NEW DEVICE DETECTS POISONOUS GAS IN TUNNELS

THE movement of heavy automobile traffic through tunnels should be made measurably safer by the use of a carbon monoxide recorder and alarm devised by chemists of the Pittsburgh experiment station of the Bureau of Mines, Department of Commerce.

Experimental work previously conducted by the Bureau of Mines showed that the percentage of carbon monoxide, the poisonous constituent of automobile exhaust gases, varies from 0.5 to 14.0 per cent of the gases. It was found further that harmful effects to persons traversing tunnels may result from exposure to concentrations of carbon monoxide exceeding four parts in 10,000 parts of air. The results of these tests were made use of in designing the ventilating system for the great vehicular tunnels under the Hudson River at New York City, which are now nearing completion.

The data obtained for the Hudson River vehicular tunnel were applied also to the Liberty vehicular tunnels at Pittsburgh, which consist of twin tunnels 5,888 feet long. To aid in the maintenance of safe conditions in the Liberty tunnels, an apparatus that would automatically determine and record even extremely low concentrations of carbon monoxide, was desired, and the development of a suitable recorder was undertaken by the Pittsburgh experiment station of the Bureau of Mines.

The principle employed in the design of the new carbon monoxide recorder is measurement by means of thermocouples of the increased temperature of the gases when the carbon monoxide and oxygen react chemically in the presence of a catalyst, the thermoelectric effects being recorded by means of a recording potentiometer. After extended experimentation and development a recorder was produced which is not appreciably affected by the presence of other gases and which is capable of indicating and continuously recording the highly diluted carbon monoxide. Operation over a period of many months has proved it to be reliable.—*Department of Commerce, Washington.*

AN AID TO CERTAIN TECHNICAL PROCEDURES

TESTS by medical authorities show that the use of cellophane, a new chemical product used principally for wrapping, for a sterilizable dialyzing membrane will probably make practical a whole field of bacteriology as yet hardly explored.

Donna E. Kerr and H. W. Hill, M.D., Director of the Vancouver General Hospital Laboratories, made these tests which are described in part in the *Vancouver Medical Association Bulletin* for February 1926. It stated that:

In searching for a sterilizable dialyzing membrane, a suggestion came from the Christmas boxes of candy wrapped in glistening sheets of "paper." The resemblance of this material to thin sheets of collodin has been used in testing its dialyzing powers, which, for silver nitrate, sodium chloride and glucose, proved perfect. The next step was to test its resistance to sterilization. Fifteen pounds of steam for twenty minutes in an ordinary laboratory autoclave left it unchanged in appearance, feel, etc. Its dialyzing powers were still unaffected.

The various uses of such a membrane in physics, chemistry, and especially in bacteriology and biology, both scientific and applied, are obvious and need not be enlarged upon. With any household cement, sheets of it may be made into tubes, flat, square or round bags, etc. Diaphragms of it may be cemented across bowls, beakers or glass tubes.

So far as has been discovered, this material, known as cellophane, has not been previously advocated as a sterilizable dialyzing membrane.

INTERNATIONAL CONGRESS OF SEXUOLOGY

THE International Society of Sexuology organizes its first congress, which will take place in Berlin from the 11th to the 15th of October, 1926. The most prominent sexuologists will take part in this congress. All questions in relation to sexual life in the different scientific sections

will be discussed in regard to society, economical life, hygienics, legal and illegal connections, medicine in general and biology, problems of sexual character, questions relating to the law, such as criminality, i. e., criminality of women as sexual beings and the development of the youth, dependencies of sexual life in connection with political questions of population, birth retrogradation and eugenics, pedagogics and psychology, psycho-analysis and feminine questions. The principal problems will be treated by referents in part with conreferents and previously selected orators will be chosen. For any other questions free discussion will be allowed.

The reconstruction of the society after the war is so to say complete. We give hereunder the names of members belonging to this society:

Almkvist (Stockholm), Benda (Berlin), Beron (Sofia), Bianchini (Teramo Abruzzi), Bjerre (Stockholm), Bouin (Strassburg), Charlotte Bühler (Wien), Karl Bühler (Wien), Ceni (Cagliari), Champy (Paris), Cifuentes (Madrid), Crew (Edinburgh), Charles B. Davenport (New York), Eder (London), Fenyvessy (Fünfkirchen), S. Freud (Wien), Gemelli (Mailand), Gleispach (Wien), Haecker (Halle), Max Hartmann (Berlin), S. Herbert (Manchester), Jadassohn (Breslau), Jaensch (Marburg), Ernest Jones (London), Karuza (Kowno), Leeuwen (Utrecht), Lépine (Lyon), Liebermann (Budapest), Lipschütz (Dorpat), Lundborg (Upsala), Max Marouse (Berlin), Martin (Lyon), Meisenheimer (Leipzig), Mieli (Rome), Mingazzini (Rome), Nékam (Budapest), Pézard (Paris), Philiptschenko (Leningrad), Piéron (Paris), Policard (Lyon), Popenoe (Coachella Californien), Recasens (Madrid), Bertrand Russell (London), Knud Sand (Kopenhagen), Seitz (Frankfurt), Snikers (Riga), Sommer (Giessen), Spann (Wien), Steinmetz (Amsterdamm), Williams Stern (Hamburg), Utitz (Halle), Vierkandt (Berlin), von Wiese (Köln), Wilhelm (Chile), Wladyczko (Wilna), Julius Wolf (Berlin), Würzburger (Leipzig), Zawadowsky (Moskau).

For any information regarding the society and the congress please apply to Dr. Moll, Berlin W. Kurfürstendamm 45, or to Dr. Stutzin, Berlin W. Kurfürstendamm 44.

FOURTH OF JULY CASUALTIES IN 1925

THIRTY-SEVEN children burned to death, 25 fatalities from lockjaw, 19 deaths from explosions, 8 shot, 22 dead from torpedoes, sky rockets and firecrackers—total deaths reported 111. Minor casualties—79 disfigured by the loss of arm, leg or fingers, 148 blinded in one or both eyes, and enough others hurt to bring the total of non-fatal accidents up to 1030. That is part of the price we are paying for our safe and sane celebration of Independence day, six weeks ago. The returns are in from only 36 of the 48 states. A complete record would probably show several hundred deaths and several thousand injuries, with children the heaviest sufferers. As the statistics come from the American Museum of Safety and the National Commission for the Prevention of Blindness, there is no reason to doubt their accuracy.

This is a pretty high price to pay for legal celebration of a great historic event. The two reporting agencies believe that "if a record were kept of the casualties resulting from the use of fireworks since 1776, it would undoubtedly be found that more persons have been killed and injured during celebrations commemorating our Independence day than were killed and injured during the revolutionary war." The fatalities are not nearly so numerous as they were a decade or two ago, thanks to the unending agitation of "cranks," "reformers," "dreamers," and "visionaries," but the toll is still altogether too heavy.—*The Boston Herald,* August, 1925.

RESOLUTION ADOPTED BY THE WHITE CROSS INTERNATIONAL ANTINARCOTICS SOCIETY, 34 WEST 49TH ST., NEW YORK CITY

Whereas there was introduced in the Senate of the United States on April 19 (Calendar day April 24) 1926, a bill (S 4085) to strengthen the Harrison Narcotic Act of December 17, 1914, as amended; and

Whereas it would seem desirable for the Congress of the United States, in connection with the consideration of such proposed amendatory legislation, to review the field of narcotic regulation with a view to adopting legislation which will conform the regulation of such a trade to the situation as developed by such an investigation,

Now, Therefore, Be It Resolved, that The White Cross, Inc. request Hon. Reed Smoot, a member of the Senate, to secure opportunity for Hearings on Senate Bill 4085, at such time as will facilitate full representative expressions by those interested in the narcotic problem and in case further inquiry is thought advisable then Mr. Smoot is requested further to obtain a federal investigation, by a committee to be appointed for that purpose, of the narcotic situation in this country, with a view to obtaining a better understanding of the narcotic evil, and the adoption of such legislation as such an investigation will suggest.

The foregoing Resolutions were adopted at a meeting of the Board of Directors of The White Cross, Inc., International Antinarcotics Society, in New York City, May 1st, 1926.

WM. K. MCKIBBEN, *Secretary.*

The bill reads as follows:

S. 4085

IN THE SENATE OF THE UNITED STATES

April 19 (calendar day, April 24), 1926

Mr. Smoot introduced the following bill, which was read twice and referred to the Committee on Finance:

A BILL

To strengthen the Harrison Narcotic Act of December 17, 1914, as amended, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Harrison Narcotic Act of December 17, 1914, as amended, be further amended as follows:

SECTION 1. Strike out the period at the end of the fourth paragraph of Section 1, substitute a colon, and add the following: "Provided, That any person addicted to the habitual use of opium or coca leaves, or any compound, manufacture, salt, derivative, or preparation thereof, when such use is not in the course of professional practice only, shall not be allowed to register under this Act: And provided further, That in addition to any penalty which may be imposed under Section 9 hereof, any person hereafter convicted of a violation of this Act shall not be granted registration under this Act for a period of one year from the 1st day of July next following the date of such conviction."

SEC. 2. That the second clause of the twelfth paragraph of Section 1 be changed to read as follows: "and the absence of appropriate tax-paid stamps from any of the aforesaid drugs shall be prima facie evidence of a violation of this section in the judicial district where such drugs are found by the person in whose possession the same may be found."

SEC. 3. Section 2, Subsection (a), is hereby amended to read as follows: "To the dispensing or distribution of any of the aforesaid drugs to a patient by a physician, dentist, or veterinary surgeon registered under this Act in the course of his professional practice only: Provided, That no dispensing or distribution of the aforesaid drugs pursuant to the so-called ambulatory treatment for narcotic-drug addiction shall be construed to be in the course of his professional practice only: Provided, That such physician, dentist, or veterinary surgeon shall keep a record of all such drugs dispensed or distributed, showing the amount dispensed or distributed, the date, and the name and address of the patient to whom such drugs are dispensed or distributed, except such as may be dispensed or distributed in emergency cases only; and such record shall be kept for a period of two years from the date of dispensing or distributing such drugs, subject to inspection, as provided in this Act."

SEC. 4. Section 2, Subsection (b), is hereby amended by inserting the following proviso after the first clause and before the first proviso thereof: "Provided, That such drugs shall not be sold, dispensed, or distributed under circumstances from which the dealer might reasonably deduce that the prescription was not issued by the physician, dentist, or veterinary surgeon in the course of his professional practice only: And"

SEC. 5. The first sentence of the second proviso of Section 6 is hereby amended to read as follows: "Provided further, That any manufacturer, producer, compounder, or vendor (including dispensing physicians) of the preparations and remedies mentioned in this section shall keep a record of all purchases, sales, exchanges, or gifts of such preparations and remedies in such manner as the Commissioner of Internal Revenue, with the approval of the Secretary of the Treasury, shall direct."

SEC. 6. That in the enforcement of the Act of Congress of December 17, 1914, known as the Harrison Narcotic Act, as amended, the provisions of Section 3450 of the Revised Statutes shall apply, in so far as they are in anywise applicable thereto, and the said provisions of said section are hereby re-enacted for that purpose.

THE ROCKEFELLER FOUNDATION EXPENDED $9,113,730 IN 1923 IN ITS CONTEST WITH DISEASE

THE International Health Board, the China Medical Board, the Division of Medical Education and the Division of Studies, according to the first installment of Dr. Vincent's report, spent the huge sum which appears in this heading in the promotion of health work. The policy of the Foundation has been to work through governments but avoids activities which might be regarded as competitive in relation to government activities, and the work of the Foundation will be suspended whenever it may be found that its functions are not co-operative.

Eighteen countries have been aided in the work against hookworm disease through treatment of 1,500,000 people and the maintenance of thousands of latrines.

Yellow fever has practically been conquered in the Americas, and Africa is the only remaining stronghold of this disease.

The challenge of Africa is found in a region as large as the area of the United States east of the Mississippi with a population of 30,000,000 natives. These people are superstitious and ignorant and present a tremendous problem. The most effective poison in dealing with mosquito larvae is found to be paris green, which when mixed with road dust in the proportion of one part of the poison with 99 of the dust is effective and cheap.

$3,000,000 was given to medical schools and new health projects in 1925.

MAINE MORTALITY STATISTICS: 1925

THE Department of Commerce announces that the 1925 death rate for Maine was 1,372 per 100,000 population as compared with 1,379 in 1924. The principal decreases in rates were from whooping cough (from 11 to 3 per 100,000 population), measles (from 6 to 1), and diphtheria (from 8 to 4).

The principal increases in the rates in 1925 were from influenza (from 25 to 42 per 100,000 population), diseases of the heart (from 225 to 240), nephritis (from 95 to 105), and cancer (from 122 to 132).

DEATHS IN MAINE

Cause of death	Number		Rate per 100,000 estimated population	
	1925	1924	1925	1924
All causes*	10,792	10,754	1,371.8	1,378.9
Typhoid and paratyphoid fever	53	51	6.7	6.5
Malaria	1	—	0.1	—

*Exclusive of stillbirths.

Smallpox	—	—	—	—
Measles	11	45	1.4	5.8
Scarlet fever	22	23	2.8	2.9
Whooping cough	26	84	3.3	10.8
Diphtheria	34	60	4.3	7.7
Influenza	333	194	42.3	24.9
Dysentery	10	8	1.3	1.0
Erysipelas	21	24	2.7	3.1
Lethargic encephalitis	5	5	0.6	0.6
Meningococcus meningitis	6	4	0.8	0.5
Tuberculosis (all forms)	497	533	63.2	68.3
Of the respiratory system	397	443	50.5	56.8
Of the meninges, central nervous system	36	30	4.6	3.8
Other forms	64	60	8.1	7.7
Syphilis†	104	115	13.2	14.7
Cancer and other malignant tumors	1,040	952	132.2	122.1
Rheumatism	38	54	4.8	6.9
Pellagra	1	2	0.1	0.3
Diabetes mellitus	173	157	22.0	20.1
Meningitis (non-epidemic)	37	32	4.7	4.1
Cerebral hemorrhage and softening	1,129	1,219	143.5	156.3
Paralysis without specified cause	37	31	4.7	4.0
Diseases of the heart	1,889	1,758	240.1	225.4
Diseases of the arteries, atheroma, aneurysm, etc.	332	385	42.2	49.4
Bronchitis	78	86	9.9	11.0
Pneumonia (all forms)	771	792	98.0	101.6
Respiratory diseases other than bronchitis and pneumonia (all forms)	68	62	8.6	7.9
Diarrhea and enteritis (total)	191	195	24.3	25.0
Diarrhea and enteritis (under 2 years)	144	163	18.3	20.9
Diarrhea and enteritis (2 years and over)	47	32	6.0	4.1
Appendicitis and typhlitis	133	124	16.9	15.9
Hernia, intestinal obstruction	87	110	11.1	14.1
Cirrhosis of the liver	43	32	5.5	4.1
Nephritis	828	741	105.2	95.0
Puerperal septicemia	30	37	3.8	4.7
Puerperal causes other than puerperal septicemia	96	115	12.2	14.7
Congenital malformations and diseases of early infancy	750	838	95.3	107.4
Suicide	118	110	15.0	14.1
Homicide	17	12	2.2	1.5
Accidental and unspecified external causes (total)	563	563	71.6	72.2
Burns (conflagration excepted)	36	31	4.6	4.0
Accidental drowning	70	76	8.9	9.7
Accidental shooting	24	24	3.1	3.1
Accidental falls	124	116	15.8	14.9
Machinery accidents	22	27	2.8	3.5
Railroad accidents	30	25	3.8	3.2
Collision with automobile	3	9	0.4	1.2
Other railroad accidents	27	16	3.4	2.1
Street-car accidents	3	3	0.4	0.4
Collision with automobile	1	—	0.1	—
Other street-car accidents	2	—	0.3	—
Automobile accidents (excluding collision with railroad and street cars)	98	91	12.5	11.7
Injuries by vehicles other than railroad cars, street cars, and automobiles‡	21	18	2.7	2.3
Excessive heat (burns excepted)	5	1	0.6	0.1
Other external causes	130	151	16.5	19.4
All other defined causes	1,092	1,079	138.8	138.4
Unknown or ill-defined causes	128	122	16.3	15.6

†Includes tabes dorsalis (locomotor ataxia) and general paralysis of the insane.

‡Includes airplane, balloon, and motorcycle accidents.

VILLAGE DOCTORS MORE NUMEROUS BUT HARDER WORKED THAN CITY COLLEAGUES

VILLAGE communities have only about two-thirds as many physicians in proportion to the number of inhabitants as have medium-size cities, according to figures just made public by the Institute of Social and Religious Research, New York, in a report, "American Villagers," by Dr. C. Luther Fry, in which are presented the results of an interpretative study of previously unpublished 1920 census data for 177 agricultural villages selected to be as fully representative as possible of the entire United States.

But the villages themselves, as distinguished from the "village communities," have proportionately more physicians than the cities have. The Institute's computations for the different regions show that per 1,000 inhabitants the Middle Atlantic villages have 2.9 physicians and the cities 1.6, the Middle West villages 2.8 physicians and the cities 2.2, and the Southern villages 3.6 and the cities 2.1, while the Far West villages have 2.8 physicians and the cities 2. per thousand inhabitants.

"Of course, the large villages have more physicians than the small centers have," says the report, "but the increase does not keep pace with growth of village population, with the result that the proportionate number of doctors decreases as the villages become larger.

"These figures do not mean, however, that villages have a larger number of doctors in proportion to the population they serve. It is a known fact that Village physicians serve open-country inhabitants as well as villagers. The first-hand studies of the Institute's field workers found that almost no doctors live in the open-country areas adjacent to villages. Open-country inhabitants are therefore compelled to turn to villages when they want medical attention.

"In every region the cities have from one-third more to nearly twice as many doctors as 'village communities.' These differences are all the more significant because the distance a village doctor must travel in visiting many of his

rural patients makes it difficult for him to care for as many people as can a city doctor.

"The professional functions rendered by villages steadily expand with the increasing size of the village. . . . The only professional persons in very small villages are, with few exceptions, the teacher, the doctor and the clergyman. As the village grows larger the lawyer and the dentist enter. Further increases in size bring the musician and the veterinary surgeon, while last of all comes the trained nurse."

ANNUAL REPORT OF THE TRUSTEES OF THE MASSACHUSETTS GENERAL HOSPITAL

THE 112th Annual Report of the Trustees of the Massachusetts General Hospital, covering the activities of the year 1925, is of unusual interest. Developments in the physical equipment of the Hospital center around the changes which have been made in the Bulfinch Building. The interior of this, the original building of the Massachusetts General Hospital, has been entirely remodeled; the alterations now provide space for 240 patients instead of 191, as formerly. Space is also provided for offices for certain full-time members of the Staff, and for laboratories for research as well as for routine examinations.

The Staff of the Hospital has undergone several important changes, both in personnel and in the development of special lines of research. Dr. J. Homer Wright, for many years Pathologist to the Hospital, has resigned from that position and been made Consulting Pathologist. Dr. Oscar Richardson, assistant pathologist, has retired after 28 years of service. Dr. Tracy B. Mallory has been appointed Chief of the Department of Pathology. It is planned to enlarge the scope of this department of the hospital, and to bring it into closer alliance with the medical and surgical services.

Another change of policy is the gradual introduction into the hospital system of men devoting a part or all of their time to clinical or laboratory research. A number of such men have been given offices at the hospital, where they may see private patients. Several groups of investigators have been organized, and will work on problems of internal secretion, lead poisoning, the biliary tract, therapeutics of cardiac disease, bronchial asthma and various other problems.

The Statistics of the Director in regard to hospital admissions and cost of maintenance are interesting. The average daily cost per house patient has risen from $4.36+ in 1917 to $6.04+ in 1925; the average daily cost per out patient has increased from $0.44— in 1908 to $0.80— in 1925. Of the 118,786 patients' days at the General Hospital 58,243 were free. In spite of this fact, it appears that the proportion of patients paying board full time has steadily increased from 13% in 1891 to 64% in 1925, whereas the percentage of free patients has decreased, being 80% in 1891 and less than 14% in 1925. The significance of these figures is not obvious. Whether the Massachusetts General Hospital now draws its patients from a more well-to-do class, whether there are relatively fewer really poor people, or whether the hospital is more successful in securing at least a part of the patient's cost from him, we are unable to say. Perhaps all these factors are operative. At any rate the report testifies to the tremendous amount of work done by this institution, and suggests that we may expect further contributions to science, as well as to the health of the community.

SANITARY CODE AND REGULATIONS GOVERNING THE CONDUCT AND MAINTENANCE OF X-RAY LABORATORIES IN THE CITY OF NEW YORK

SANITARY CODE

Section 107. No person shall maintain, operate or conduct an X-ray laboratory or advertise or hold out to the public that an X-ray laboratory is maintained, operated or conducted, wherein radiographs are taken, diagnoses made or human beings examined or treated by X-rays, without a permit therefor issued by the Board of Health, or otherwise than in accordance with the terms of said permit and with the Regulations of the said Board. (As adopted by the Board of Health, January 26, 1922.)

REGULATIONS GOVERNING THE CONDUCT AND MAINTENANCE OF X-RAY LABORATORIES IN THE CITY OF NEW YORK. (ADOPTED BY THE BOARD OF HEALTH JANUARY 26, 1922.)

Regulation 1. Information to be furnished by applicant. Every application for a permit to conduct an X-ray laboratory shall be made in writing on an official blank to be furnished by the Health Department and must contain the following information:

Location of building.
Location in building.
Character of building.
Name of owner of building. Address.
Name of applicant. Address.

If a corporation:—

(1) When and where incorporated.
(2) In what County certificate has been filed and date filed.
(3) Officers of the corporation.
(4) Place of business of the corporation.
(5) Full and accurate incorporate name.

If a partnership:—

(1) Names of persons composing partnership in full, with their places of residence.

If a trade name:—

(1) The full names of the person or persons doing business under such trade name.
(2) Complete and full trade name.
(3) Place of filing of certificate as required by the statute, and date filed.

Regulation 2. A duly qualified person to be in charge. Every X-ray laboratory shall at all times be in charge and under the direction of a duly licensed physician or other person who is licensed under the Laws of this State to diagnose and treat diseases and whose knowledge, experience and qualifications to operate and use an X-ray machine are satisfactory to the Health Department. (As amended by the Board of Health, Feb. 6, 1926.)

Regulation 3. Precautions against danger. Every X-ray laboratory shall be so constructed as to confine within the operating room the rays emanating from the machine and it shall be equipped with suitable and necessary appliances and devices at all times when the X-ray machine is in operation for the proper protection of patients, operators and all other persons or property adjacent, contiguous to or coming in contact with the electrical or other current or force or spark generated or incident to the operation and use of the X-ray machine.

Regulation 4. Permits may be revoked in the discretion of the Board of Health.

Regulation 5. No permits shall be transferable as to the person or place. A permit is issued to a particular person, firm or corporation and for a given location and is not valid for use by any other person or in any other place than stated in the application for a permit.—*Department of Health, 505 Pearl Street, New York City.*

WEEKLY NOTES ON CHILD WELFARE TOPICS

ANTITUBERCULOSIS CAMPAIGN, MASS.

Reporting progress in the 10-year program for the control of tuberculosis in children begun in 1924, the Massachusetts Department of Public Health states that 10,000 white children between 5 and 15 were examined during the first year at clinics held in 43 cities and towns. Approximately 29 per cent of the children reacted to the tuberculin test, 28 per cent gave a history of exposure to human tuberculosis, 25 per cent of these being cases of immediate contact with the disease, and 15 per cent of the rural children gave a history of contact but did not react to the test. Among other defects discovered and treated were enlarged and diseased tonsils and adenoids in 31 per cent of the country and 26 per cent of the city children; poor posture in about 60 per cent of all the children, and valvular heart disease in 1.7 of both groups. Reëxamination of some of these children during the present year indicates that through the coöperation of the local communities, physical defects are being corrected and underweight is already being lessened.

SCHOOLING OF CHILD WORKERS, MASS.

Thirty-eight thousand children of 14 and 15 years left school to go to work in 1924, in Massachusetts, according to the Massachusetts Child Labor Committee. Only about half of these children had finished grammar school. The committee states that 41 States have a better record with regard to the school attendance of children of 14 and 15 than has Massachusetts. —*Compiled by the U. S. Children's Bureau.*

RECENT DEATHS

BOWDITCH—Dr. Henry Ingersoll Bowditch, pediatrician of Boston, died at the Peter Bent Brigham Hospital, June 8, 1926, following an operation for brain tumor, at the age of 51. He is survived by his widow and five children. Dr. Bowditch had been in failing mental health for several years.

HARDWICK—Dr. Sydney Curtis Hardwick, a Fellow of the Massachusetts Medical Society, died at Hingham, June 16, 1926, aged 42.

Dr. Hardwick was born in Quincy, July 31, 1883, son of the late Henry E. and Minnie Hardwick. He was educated in the public schools and Thayer Academy, and was graduated from Tufts College Medical School in 1905. He engaged in the practice of medicine at Quincy, but on the outbreak of the World War he entered the service and served in the medical department of the 104th Infantry, 26th Division, as regimental surgeon. While in France he was badly gassed and his health became undermined. Following his discharge from the service he resumed practice, but his health continued to fail and he went to Maitland, Fla. Since his return home he had failed steadily. He is survived by his widow, who was Mildred Rice, and a son, Sydney, a sophomore at the Massachusetts Institute of Technology.

WHEATLEY—Dr. Frank George Wheatley, a Fellow of the Massachusetts Medical Society since 1884 and prominent in the affairs of the Society, died at his home in North Abington, June 14, 1926, at the age of 74.

Dr. Wheatley was born in Woodbury, Vt., July 6, 1851, and was graduated from Dartmouth with Phi Beta Kappa honors in the class of 1879, and from Dartmouth Medical School in 1884. From 1889 to 1891 Dr. Wheatley was lecturer on materia medica and therapeutics in the College of Physicians and Surgeons, Boston, and from 1893 to 1900 he was professor of therapeutics and clinical medicine in the Tufts College Medical School.

He was chairman of the trustees of the State school for the feeble-minded, a pension examiner for Plymouth County, medical examiner in the same county, and town moderator, and had served in both branches of the Legislature.

For years Dr. Wheatley had been a councilor of the State medical society, often serving on the nominating committee.

He is survived by a widow, by Dr. Frank E. Wheatley of Boston, and by three other sons.

His genial presence and sound advice will be much missed.

CORRESPONDENCE

REGISTRATION REVOKED

June 4, 1926.

Editor, Boston Medical and Surgical Journal:

This is to inform you that the Board of Registration in Medicine, after a hearing held June 3, 1926, revoked the registration and cancelled the certificate of Dr. James O. Lacaillade as a practitioner of medicine in this Commonwealth.

Very truly yours,
FRANK M. VAUGHAN, *Secretary.*

NOTE:—Dr. Lacaillade had been under observation for some time because of rumors of illegal practice.

At the hearing a witness testified that she had appealed to him to relieve her of a pregnancy and had paid him two hundred dollars.

A detective gave testimony tending to show that Dr. Lacaillade was disposed to consider overtures with respect to performing illegal operations.

A CRY FOR HELP

Mr. Editor:

Representative Ashton of Fall River in a recent debate at the State House listed a number of physicians who were, he claimed, opponents of vaccination, disbelievers in its efficacy, believers in the repeal of our compulsory public school laws on that subject. Neither he nor Dr. Padelford, well known antivaccinationist, will give me the names of these physicians, the former telling me that I could "readily obtain the names of all physicians and scientists in both the Eastern and Western Continents by a diligent search and inquiry as made" by himself "and others" (his efforts produced perhaps a dozen), and the latter giving me much good advice, recommending the perusal of certain books and the paying of "less attention to men and more to facts," kindly referring to my "stooping" to use my influence on members of the Legislature, and even enclosing a printed leaflet of the Medical Liberty League in which I am referred to without praise, but leaving me in complete ignorance as to the identity of the gentlemen in question.

I therefore ask your readers, and particularly those from Fall River, who the physicians are, whose names (states Dr. Padelford) "would surprise" me if I should learn that they were with him in his efforts to break down our vaccination laws; who is the modest practitioner who "does not know what vaccine virus is nor what it will do nor how long it will protect from smallpox but under no circumstances would have his children vaccinated, law or no law, and would rather have a bungling surgeon operate on him for appendicitis than submit to vaccination," yet "who would not like it to become known that he is opposed to vaccination"; who is the physician that told Dr. Padelford that he was with him and a month later wrote a letter for publication on the other side of the question; where are to be found the "surprising number of physicians" that will admit that "submission to vaccination should not be made compulsory but who will in public say nothing," and finally who are the physicians who are bold enough to allow their names to be shouted out in legislative halls but whose identity is not to be disclosed to members of their own profession. Are all these physicians from Fall River? Have the names given by Mr. Ashton been given with the consent of their owners or are they the names of those whose opinions are for Dr. Padelford's ear only and not for oi polloi? Are they simply names to conjure with, names without owners, names and names only?

As an earnest seeker after the truth, no matter whose toe is stubbed, turned down by those who could so easily help me "an they would," I appeal through you to medical men in general and cry out for help.

SAMUEL B. WOODWARD.

AN ANECDOTE OF VON HUMBOLDT AND AGASSIZ

Mr. Editor:

For the physician's extra-medical reading there is no more delightful book than Bayard Taylor's "Life, Travels and Books of Alexander Von Humboldt."

The anecdote illustrates that delightful and almost indescribable quality of good will and interest of a great scientist towards a worthy young disciple.

Humboldt was at this time (1831) at Paris on a diplomatic mission.

"It was at this time that Humboldt first met Agassiz, then a poor student, now the celebrated Professor. 'I was only 24 years of age,' says Agassiz, in his touching tribute to the memory of Humboldt, 'when in Paris, whither I had gone with means given to me by a friend, but was at last about to resign my studies from want of ability to meet my expenses. Professor Mitscherlich was then on a visit to Paris, and I had seen him in the morning, when he had asked me what was the cause of my depressed feelings, and I told him that I had to go, for I had nothing left. The next morning, as I was seated at breakfast, in front of the yard of the hotel where I lived, I saw the servant of Humboldt approach. He handed me a note, saying there was no answer, and disappeared.

" 'I opened the note, and I see it now before me as distinctly as if I held the paper in my hand. It said:

" ' "My friend, I hear that you intend leaving Paris in consequence of some embarrassments. That shall not be. I wish you to remain here as long as the object for which you came is not accomplished. I enclose you a check for fifty pounds. It is a loan which you may repay when you can." ' "

Agassiz further said, "What he has done for me I know he has done for many others—in silence and unknown to the world."

"It was through Humboldt's liberality in 1833 that Agassiz was enabled to commence the publication of his great work on Fossil Fishes, and in the fulfilment of a mission suggested to the King of Prussia by the same kind friend, that he emigrated to the United States in 1846."

In November, 1856, Taylor paid a visit to Von Humboldt. He says, "I came to Berlin . . . for the sake of seeing and speaking with the world's greatest living man."

Humboldt's library is described in detail, and looked exactly like Hildebrand's picture of it, the lithograph copy of which is familiar to many.

In the library was a little box, containing a small chameleon sent to Humboldt from Smyrna. "A peculiarity of this animal," said Humboldt to Taylor, "is its power of looking in different directions at the same time. He can turn one eye toward heaven while his other eye inspects the earth. There are many clergymen who have the same power."

Very truly yours,
WM. PEARCE COUES, M.D.

May 18, 1926.

IS COD LIVER OIL NECESSARY FOR THE NORMAL INFANT?

Editor, Boston Medical and Surgical Journal:

It is undoubtedly true that cod liver oil will promote healing of the bone in severe cases of rickets, and that it may prevent mild cases from becoming severe. It is also true that in the large cities of this country, if Roentgen ray plates of the bones are used

as a diagnostic aid, from 80 to 85 per cent. of all babies of the hospital class are found to have bony changes indicating mild or severe rickets. Many of these babies are in excellent nutritional condition, and much of the "rickets" is "physiologic" rickets, in a rapidly growing organism, tends to heal spontaneously, and never gets any worse. All the statistics for the occurrence of rickets have been drawn from the hospital class of patients, including many negroes, Italians, and other foreigners, who are notoriously subject to rickets. As far as I know, there are no figures available for American babies of well-to-do or wealthy parents, who have been carefully fed, and who are taken out of doors every day, winter and summer. Many of these babies undoubtedly have "physiologic" rickets, demonstrated by Roentgen ray examination of the bones, but not the flabby musculature, relaxed ligaments, delayed closure of the fontanelle, and other phenomena which are indicative of true rickets. In a word, the health and well-being of the infant is not impaired in the slightest by whatever "rickets" may be present.

In the last two years the statement has been made many times that cod liver oil is a necessary part of the diet of young infants, that it must be given to *all* babies as a prophylactic against rickets, whether they are well or sick, rich or poor, breast or bottle fed. This fashion has spread so that mothers, while they object to having the baby and all its clothes flavored with cod liver oil, feel that the baby is not being properly cared for unless it gets its daily quota of oil, and they are afraid that if it is not given, the baby will be sickly and deformed, unsteady and fragile, like a "rickety" piece of furniture. "Rickets" to them means something very terrible, on account of the sound of the word.

Is cod liver oil necessary or even desirable for normal babies in well-to-do families? Do well babies who are cared for under the best possible conditions have enough rickets to amount to anything? Most pediatricians of experience agree that in well-to-do practice severe or even moderate rickets is no problem at all, and is of infrequent occurrence in full term infants who go out of doors a good deal. Rickets, if it does occur, is of the mild "physiologic" variety, to be demonstrated only by slight changes in the Roentgen ray appearance of the bone, does the baby no harm whatever, heals spontaneously, and may be looked upon as a practically normal concomitant of rapid growth. Furthermore, is it true that cod liver oil prevents the development of rickets? It is quite possible that it may prevent an existing rickets from becoming worse, but, in the three most painstaking and extensive investigations of clinical rickets that have been undertaken in the last few years in America, it has been conclusively shown that cod liver oil does not prevent the development of rickets at all. Eliot[1] found that 96 per cent. of a group of 216 infants of the lower classes who had been taking cod liver oil, developed rickets. "Its universality raised the question whether this slight degree of rickets must not be considered normal." De Buys and von Meysenburg[2] found more rickets in a group of 191 infants who had been given cod liver oil from the time they were one month old, than in a control group to which no cod liver oil had been given. Wilson[3] found that 91 per cent. of a series of babies who had been given cod liver oil from earliest infancy developed rickets. "*A comparison of the degree and incidence of rickets observed in infants receiving and not receiving cod liver oil did not reveal any striking difference.* If this disease described here is rickets, it would seem to be universal in young infants." With these figures (and each of these investigations was carried out most carefully by skilled observers from different clinics) why is cod liver oil a necessary part of the diet of a normal baby? If it does him no good, why should he take it?

The investigations of rickets which have been carried on by American and British pediatrists in the last few years have been brilliant, and have been productive of much good, but an entirely false idea of rickets has been produced in the minds of the laity, and sweeping conclusions have been drawn about cod liver oil, which are probably not justified by the evidence. It has not been shown that cod liver oil will prevent rickets; it has been shown conclusively that it will cause calcium deposition to take place in rachitic bone, and hence cures the pathologic process there, "a consummation devoutly to be wished," but does it cure the baby? Cod liver oil is an agent of great value, and better cod liver oil is being put out now than ever before; nobody who has kept track of recent investigations would deny it. It should be used extensively, but instead of forcing it down the innocent gullet of every inoffensive baby, would it not be much more intelligent to adhere to some such conception as the following?

1. Normal full term infants who go out of doors a good deal, and who are fed properly, are in no danger of developing enough rickets to do them any harm whatever. It has not been shown that cod liver oil does these babies any good; therefore, they should not be given it.
2. It has been shown in three separate investigations by trained observers in different parts of the country, that cod liver oil does not prevent rickets from developing.
3. It is quite probable that cod liver oil may prevent a mild form of rickets from becoming worse; therefore, it should be given as a routine to all infants who are in danger of developing severe rickets, such as twins, premature infants, Italians, negroes, and all babies who stay indoors a good deal.
4. Cod liver oil should be given to all babies who have rickets of such a degree that it is doing them harm (pathologic rickets).

LEWIS W. HILL.

483 Beacon Street.

REFERENCES

1 J. A. M. A., Vol. 85, 1925, p. 656.
2 Am. J. Dis. Ch., Vol. 28, 1924, p. 329.
3 Am. J. Dis. Ch., Vol. 31, No. 5, May, 1926.

NOTES FROM THE NATIONAL CAPITAL

(From Our Washington Correspondent)

MATERNITY AND INFANCY BILL PASSED OVER

The bill (H. R. 7555) to extend for two years the operation of the Federal Maternity and Infancy Act, which passed the House on April 5, came up in the Senate on May 18. At the request of Senator King the bill was passed over, however, and resumed its place on the calendar for future consideration. Congress is reported to be likely to adjourn in the near future and there is some question whether any action will be taken by the Senate on this measure before adjournment. If not, the bill will go over to the second session beginning next December and lasting until March.

MEETING OF STATE HEALTH OFFICERS

State and territorial health officers of the United States held a meeting with the Public Health Service in Washington on May 24 and 25. Many subjects were considered, including a registration area for morbidity reports, the sanitary control of shellfish, the education of sanitarians, plague, smallpox, rabies, scarlet fever, leprosy, the sanitation of garages and the use of tetra-ethyl lead in gasoline, county health work, and milk standards.

One important action was the adoption of a resolution endorsing a uniform milk standard for the United States. A committee reported favorably on the recommendations of Sanitary Engineer L. C. Frank of the Public Health Service that a standard

milk ordinance must: (a) effect the maximum percentage of pasteurization which each city will support; (b) improve the quality of milk before pasteurization; (c) improve the quality of any milk not pasteurized; (d) encourage greater milk consumption; (e) elicit co-operation of the dairy industry; (f) be practicable for small and large cities under all conditions; (g) be designed so as not to exclude the many cities which cannot be induced to enact a universal pasteurization ordinance and the many cities which cannot be induced to enact an ordinance which limits the sale of milk to the highest ideal grade.

HEARINGS ON MILK IMPORTATION BILL

Hearings on the bill to prohibit the importation of milk or cream into the United States unless the shipper holds a permit from the Department of Agriculture and conforms to certain sanitary requirements, were held for several days up to May 22. Various persons, including Senator Copeland, former health commissioner of New York City, appeared in favor of this measure, while representatives of Canadian dairy interests and New England milk sellers opposed the bill. Mr. Cornelius A. Parker, a Boston attorney, represented dairy firms of New England, and Mr. Theodore P. Grant of Boston, president of a large milk company, opposed the high dairy score proposed in the measure.

OTHER FEDERAL BILLS OF INTEREST TO PHYSICIANS

Payments to persons, whether in the government service or not, who give blood for blood transfusions are proposed in a bill (S. 4367) introduced by Senator Wadsworth of New York.

Army and Navy nurses may now be retired after 25 years' service with 75 per cent. pay, or after reaching the age of 50, with 20 years' service, with 60 per cent. pay, according to the terms of an act recently signed by the President. Seven nurses will be due for retirement in 1926 and 56 will be eligible for such retirement during the next ten years. The peace time strength of each of these nurse corps is about 500.

At hearings on the bill to provide a division of safety in the United States Bureau of Labor Statistics, representatives of the Public Health Service and the chief surgeon of the Bureau of Mines questioned whether the proposed collection of statistics on industrial accidents might not duplicate work already being undertaken by these other services. Representative Rathbone agreed to amend the bill to the effect that there would be no duplication.

MISCELLANEOUS ITEMS

An examination for entrance into the Public Health Service will be held on July 12 in Washington, D. C., Chicago, New Orleans and San Francisco.

The Public Health Service has recently announced that the League of Nations, with the co-operation of the Rockefeller Foundation, will send a commission to the Mississippi Basin to study methods used in combating malaria.

The United States Bureau of Labor Statistics has recently completed a study on the effects of radium on workers.

The Bureau of Animal Industry of the Department of Labor has completed a survey of tuberculosis in cattle and reports that on May 1, 1926, more than 10,000,000 official tests show a decline in the prevalence of the disease from 4 per cent. in 1922 to 2.8 per cent. in 1926.

Frederick A. Fenning, one of the three commissioners of the District of Columbia, is before the House Judiciary Committee on impeachment charges brought by Representative Blanton of Texas. Mr. Fenning is an honorary member of the District of Columbia Medical Society, which he served as attorney for several years. His practice has consisted largely of guardianship of insane veterans held at St. Elizabeth's Hospital, the government institution for the insane. A bill to provide public guardianship and put an end to wholesale private guardianship has passed the House and is now pending in the Senate.

RESUME OF COMMUNICABLE DISEASES REPORTED IN MASSACHUSETTS FOR MAY, 1926

GENERAL PREVALENCE

The only common communicable diseases which showed an increase over last month were chickenpox and German measles.

	May, 1926	Apr., 1926	May, 1925
Chickenpox	484	440	558
German measles	1,762	1,295	1,157

RARE DISEASES

Actinomycosis was reported from Boston, 1; Greenfield, 1; total, 2.

Anterior poliomyelitis was reported from Cambridge, 1; Holyoke, 1; Melrose, 1; Somerville, 1; total, 4.

Anthrax was reported from Worcester, 1.

Dog-bite requiring anti-rabic treatment was reported from Arlington, 5; Amesbury, 1; Billerica, 3; Boston, 1; Brockton, 1; Chelmsford, 1; Danvers, 1; Holyoke, 1; Lowell, 2; Marblehead, 6; Maynard, 1; Medford, 3; Northampton, 3; Peabody, 5; Revere, 3; Swampscott, Walpole, 1; Winthrop, 2; total, 63.

Dysentery was reported from Boston, 1; Fall River, 1; total, 2.

Encephalitis lethargica was reported from Boston, 2; Everett, 1; Fall River, 1; Leominster, 1; Salem, 1; Somerville, 1; Springfield, 2; total, 9.

Epidemic cerebrospinal meningitis was reported from Attleboro, 2; Cambridge, 1; Clinton, 1; Fall River, 1; Lancaster, 1; Pittsfield, 1; Somerville, 1; total, 8.

Septic sore throat was reported from Andover, 1; Boston, 4; Fall River, 3; Lynn, 1; total, 9.

Trachoma was reported from Boston, 2; Chelsea, 1; Everett, 1; Oxford, 1; total, 5.

Tetanus was reported from Boston, 1.

Total cases (all causes)	10,516	9,929

DISTRIBUTION

Case rate per 100,000 population	249.3	238.8

Certain Prevalent Diseases

	May, 1926	May, 1925
Diphtheria		
Total cases	205	351

All Communicable Diseases

	May, 1926	May, 1925
Case rate per 100,000 population	4.9	8.4

	May, 1926	May, 1925
Measles		
Total cases	3,187	3,756
Case rate per 100,000 population	75.5	90.3

Cases in cities and towns that have noticeably exceeded their median endemic indexes*:

Attleboro	30	Hingham	43
Dartmouth	34	Marlboro	40
Fairhaven	21	Needham	58
Middleboro	30	Newton	121
New Bedford	199	Wellesley	30
Framingham	41	Winthrop	112

Arlington	65	Holyoke	109
Belmont	41	Ludlow	48
Lexington	36	Northampton	25
Maynard	41	South Hadley	38
Webster	54	Springfield	114
Chicopee	50	Williamsburg	21

Scarlet Fever	May, 1926	May, 1925
Total cases	956	996
Case rate per 100,000 population	22.7	23.9

Cases in cities and towns that have noticeably exceeded their median endemic indexes*:

New Bedford 74

Tuberculosis, Pulmonary	May, 1926	May, 1925
Total cases	566	555
Case rate per 100,000 population	13.4	13.3

Tuberculosis, Other Forms	May, 1926	May, 1925
Total cases	86	85
Case rate per 100,000 population	2.0	2.0

Typhoid Fever	May, 1926	May, 1925
Total cases	30	37
Case rate per 100,000 population	.71	.88

Whooping Cough	May, 1926	May, 1925
Total cases	1,104	664
Case rate per 100,000 population	26.2	15.9

Cases in cities and towns that have noticeably exceeded their median endemic indexes*:

Boston	357	Malden	20
Brookline	56	Medford	49
Cambridge	90	Worcester	67
Newton	44		

*The median endemic index is obtained by arranging in arithmetical sequence the monthly totals of reported cases for the past five years and selecting the middle figure.

Diseases Reported for the Weeks Ending May 29 and June 5, 1926

	Weeks ending May 29	June 5
Anterior poliomyelitis	—	2
Chickenpox	157	148
Diphtheria	41	65
Dog-bite	11	11
Encephalitis lethargica	2	3
Epidemic cerebrospinal meningitis	—	1
German measles	377	268
Gonorrhea	172	48
Influenza	6	4
Measles	690	671
Mumps	161	119
Ophthalmia neonatorum	25	27
Pneumonia lobar	79	60
Scarlet fever	234	202
Septic sore throat	5	1
Suppurative conjunctivitis	12	4
Syphilis	52	28
Tetanus	1	0
Trachoma	2	2
Tuberculosis pulmonary	133	109
Tuberculosis, other forms	25	15
Tuberculosis, hilum	8	5
Typhoid fever	8	3
Whooping cough	248	177

Diseases Reported for the Weeks Ending June 5 and 12, 1926

	Weeks ending June 5	June 12
Anterior poliomyelitis	2	1
Chickenpox	148	187
Diphtheria	65	49
Dog-bite	11	16
Encephalitis lethargica	3	1
Epidemic cerebrospinal meningitis	1	2
German measles	268	320
Gonorrhea	48	130
Influenza	4	8
Malaria	—	2
Measles	671	732
Mumps	119	156
Ophthalmia neonatorum	27	35
Pellagra	—	2
Pneumonia, lobar	60	90
Scarlet fever	202	222
Septic sore throat	1	4
Suppurative conjunctivitis	4	5
Syphilis	28	63
Trachoma	2	—
Trichinosis	—	1
Tuberculosis, pulmonary	109	92
Tuberculosis, other forms	15	26
Tuberculosis, hilum	5	22
Typhoid fever	3	11
Whooping cough	177	214

CONNECTICUT DEPARTMENT OF HEALTH

Morbidity Report for the Week Ending June 5, 1926

Diphtheria	18	Cerebrospinal meningitis	2
Last week	14	Chickenpox	54
Diphtheria bacilli carriers	6	German measles	25
Whooping cough	29	Influenza	6
Last week	39	Mumps	5
Typhoid fever	1	Pneumonia, lobar	25
Last week	0	Tuberculosis, pulmonary	32
Scarlet fever	80	Tuberculosis, other forms	4
Last week	84	Gonorrhea	5
Measles	421	Syphilis	13
Last week	544		
Bronchopneumonia	24		

RHODE ISLAND STATE BOARD OF HEALTH

Contagious Diseases Reported for the Week Ending May 15, 1926

Diphtheria	10	German measles	27
Measles	98	Pneumonia	3
Whooping cough	15	Mumps	2
Scarlet fever	12	Tuberculosis	6

Contagious Diseases Reported for the Week Ending May 22, 1926

Diphtheria	11	Mumps	4
Chickenpox	3	German measles	29
Septic sore throat	2	Whooping cough	13
Measles	74	Tuberculosis	15
Scarlet fever	8		

NEWS ITEMS

APPOINTMENT OF DR. HILBERT F. DAY—Dr. Hilbert F. Day has been made a visiting surgeon at the Cambridge Hospital.

EXHIBIT OF TYPES OF SERVICE OFFERED THE PRACTICING PHYSICIAN—There will be an exhibit by the Massachusetts Department of Public

Health at the Massachusetts Medical Society meeting, showing the types of service offered to the practicing physician by the Department. One phase will deal with serums and vaccines produced at the Biological Laboratories at Forest Hills, another with the work of the Wassermann Laboratory, a third with certain activities along the line of food and drugs. The bacteriological diagnostic service will be featured, as will be that for cancer. What the Department can offer the physician in the way of assistance in child hygiene and the extensive service offered by the Division of Tuberculosis in the way of diagnostic clinics and sanatorium treatment will complete the exhibit.

ELECTION OF DR. SMITH ELY JELLIFFE—Dr. Smith Ely Jelliffe of New York has been made a corresponding member of the Vienna Society of Psychiatry and Neurology.

ELECTION OF OFFICERS OF THE RHODE ISLAND STATE MEDICAL SOCIETY—At the annual meeting held June 3, 1926, the following named officers were elected: President, Herbert G. Partridge, M.D., Providence; Vice-President, Norman MacLeod, M.D., Newport; Second Vice-President, Arthur H. Harrington, M.D., Howard; Secretary, J. W. Leech, M.D., Providence; Treasurer, J. E. Mowry, Providence.

ELECTION OF DR. KLINE—Dr. George M. Kline, Commissioner of Mental Diseases for the Commonwealth of Massachusetts, has been elected president of the American Psychiatric Association at the annual convention held recently.

DEDICATION OF THE JOHN B. MURPHY MEMORIAL BUILDING—The John B. Murphy Memorial Building is finished, paid for and will be dedicated the evenings of June 10 and 11, at 48 East Erie Street, Chicago, Ill. Invitations have been issued to members of the medical profession and others.

REMOVAL—Dr. Roy J. Heffernan has changed his office address from 510 to 524 Commonwealth Avenue, Boston.

REAPPOINTMENT OF DR. EDWARD P. WORTH—In the list of appointments by the Governer published June 3, 1926, appears the name of Dr. Edward P. Worth of Edgartown as medical examiner of the First Dukes District. Dr. Worth is a member of the Massachusetts Medical Society.

DR. DAVID CHEEVER has returned after having enjoyed his sabbatical leave of absence in California and will resume practice.

APPOINTMENT OF DR. MORRIS LEVINE—Dr. Morris Levine has been promoted to associate professor of otology at the New York Post-Graduate Medical School and Hospital.

NOTICE

UNITED STATES CIVIL SERVICE EXAMINATION

The United States Civil Service Commission announces the following open competitive examination:

Senior Medical Technician (Pathology)

Applications for senior medical technician (pathology) must be on file at Washington, D. C., not later than July 13. The examination is to fill a vacancy in the Surgeon-General's Office, War Department, Washington, D. C., and vacancies occurring in positions requiring similar qualifications.

The entrance salary is $1860 a year. After the probational period required by the civil service act and rules advancement in pay without material change in duties may be made to higher rates within the pay range for the grade, up to a maximum of $2400 a year. Promotion to higher grades may be made in accordance with the civil service rules as vacancies occur.

The duties, under direction, are to dissect, prepare, describe, and classify histological and pathological specimens and arrange such materials for sectioning, study, and display; to do research work in technical methods; and to perform related duties as assigned, including assisting in autopsies.

Competitors will not be required to report for examination at any place, but will be rated on their education, training and experience.

Full information and application blanks may be obtained from the United States Civil Service Commission, Washington, D. C., or the secretary of the Board of United States Civil Service Examiners at the postoffice or custom house in any city.

REPORTS AND NOTICES OF MEETINGS

THE HAMPSHIRE DISTRICT MEDICAL SOCIETY

THE June meeting Hampshire District was held at "The Farm," the country home of Dr. Herbert B. Perry in Pelham, and as his guests, on Wednesday, June 16th. Dr. Dudley Carleton of Springfield gave the scientific paper on "Traumatic Shoulders, Negative to X-ray."

After the paper, sports were enjoyed, among them exhibition of some of Dr. Perry's famous hunters taking the hurdles, and delicious refreshments were served.

L. O. WHITMAN, *Sec.*

NEW ENGLAND HOSPITAL FOR WOMEN AND CHILDREN

THE regular monthly meeting of the Staff of the New England Hospital for Women and Children was held at the hospital on Thursday, June 3, 1926, at 7:45 P. M. Cases of birth injury, cerebral thrombosis following toxemia of pregnancy, malignancy, obscure hemorrhagic disease of infancy, puerperal sepsis, and chronic nephritis were presented by the house officers.

MASSACHUSETTS SURGICAL AND GYNECOLOGICAL SOCIETY

THE regular monthly meeting of the Massachusetts Surgical and Gynecological Society was held in conjunction with the regular staff meeting of the Massachusetts Homeopathic Hospital, May 28, 1926.

PROGRAM

(1) "Fracture of Cervical Vertebrae," T. E. Chandler, M.D.; W. H. Clewley, M.D.; N. H. Garrick, M.D.

(2) "Echinococcus in the Human Family," C. T. Howard, M.D.

(3) "Shoulder Injuries," A. G. Howard, M.D.

(4) Presentation of a Cardiac Case with Application of Electrocardiogram. Theory and Demonstration of the Taking of an Electrocardiogram, E. S. Calderwood, M.D.; W. H. Reid, M.D.; Miss Kenway.
(5) "Unusual Complication in General Peritonitis," C. Crane, M.D.
(6) "Modern Methods of Handling the Tubal Factor in Sterility," S. R. Meaker, M.D.
(7) "The Male Factor in Sterility," S. N. Vose, M.D.

MASSACHUSETTS HOMEOPATHIC HOSPITAL

THE regular monthly meeting of the Staff of the Massachusetts Homeopathic Hospital was held in the Evans Memorial on Friday, May 28, 1926, at 8 P. M.

PROGRAM

(1) Analysis of Service for the month of April.
(2) Necropsy Report for the month of April.
(3) Program of the Massachusetts Surgical and Gynecological Society.
(4) Question Box.

BOOK REVIEWS

Modern Methods of Amputation. By THOMAS G. ORR, A.B., M.D., F.A.C.S.

This neat little monograph published by C. V. Mosby Co. is one of 117 pages and contains 125 illustrations, is bound in black with gilt lettering and is printed in very easily read type.

The author states in his preface that he has intended to include only those methods which are practical and workable, and he has aimed to show, especially the occasional surgeon, the methods which are simple and give the best functional results. Many amputations give good operative but poor functional results. Emphasis is here placed on function. The history of amputations is not given and many classical procedures handed down in the literature, but no longer serviceable, are not mentioned. The chapters on cinematiplastic amputations and artificial limb fitting preseent these subjects but briefly, as the author believes these are yet in the experimental stage, and to fully discuss them would require a volume in itself.

This volume is extremely well presented in logical order and is written in a very readable and concise style. The profuse and very adequate illustrations make the text very clear. While there are not many new illustrations or methods presented, yet, for a brief treatise on this very important subject, this little volume is entirely adequate and most serviceable, especially as a hand book for the busy surgeon who wishes to refresh his mind of the best technic before doing an amputation.

Disease Prevention. By HERBERT H. WAITE, M.D., Professor of Bacteriology and Pathology, University of Nebraska. New York. Thomas Y. Crowell Company, Publishers.

This book of twenty chapters and over six hundred pages is "a digest written especially for all those who have neither a medical nor an engineering background," . . . "social workers, state and municipal officials and hospital workers," and others engaged in combatting disease.

The book represents a consistent careful effort on the part of the author to show the logical way of preventing diseases by pointing out our present knowledge as to their causation and describing events which have marked the acquisition of such knowledge.

The book is especially to be commended by reason of the attention which the author has given to animal diseases communicable to man and insect borne diseases.

In fact the amount and character of the information which the author supplies regarding so-called preventable diseases suggests the possibility that he may have overestimated the assimilative capacity of those whose needs he hopes to meet.

Archives of the Andrew Todd McClintock Memorial Foundation. Vol. 1.

This volume gives the results of a study of psittacosis, which occurred in epidemic form in Wilkes-Barre, Pennsylvania, in 1917. In the course of studying this epidemic Dr. McClintock, now deceased, developed some striking though unorthodox hypotheses which can perhaps best be summarized by the title of the present volume "Pleomorphism in Bacterial Protoplasm".

Gastric Function in Health and Disease. By JOHN A. RYLE, M.D. (Lond.) F.R.C.P., Assistant Physician and Lecturer on Medical Pathology, Guy's Hospital. 152 pages. Humphrey Milford, Oxford University Press, 1926.

This book represents an extremely wholesome attempt to advance the interests of practical medicine by the correlation of clinical symptoms referred to the stomach with disturbances of gastric function. It is an earnest and well-planned consideration which brings together the viewpoint of the clinician and that of the physiologist in a very successful manner, laying emphasis upon the importance of clinical judgment as playing a part which is not to be subordinated to but rather to be set above the

tests and scientific observations which supply some of its premises. From this point of view it reviews (1) gastric function in health; (2) gastric function in disease from the physiologic aspect and (3) gastric function in disease from the clinical aspect of the dyspepsias. The purpose of the book and the admirable tone in which it is written are well illustrated by quoting the final words of its last paragraph:

"It is certain that many of the views which it (the volume) contains must undergo modification and revision; but if these brief chapters have been successful in emphasizing the importance of symptoms, and the need for further clinical research into the nature of symptoms, they will not have been written in vain."

To this the reviewer wishes to add his opinion that while certain of the mechanisms described are still debatable, every clinician who treats cases of dyspepsia will do well to read this book and to consider the clinical manifestations of his patients in the light of what it contains.

The Surgical Clinics of North America. February, 1926, Volume 6—Number 1. Philadelphia Number: W. D. Saunders Co.

This volume of the Surgical Clinics of North America is an unusually interesting one. The clinic of W. Wayne Babcock with his vast experience and careful detail in the technique of spinal anesthesia is extremely helpful. He reports 20,000 inductions without mortality in the past eleven years. His systematized routine for the prevention of falling blood pressure, following this method of anesthesia, is so carefully worked out that his low mortality is easily accounted for.

The work of Dr. John G. Clark's clinic is also full of new and interesting items, especially helpful are the studies on cystograms and the end-results in irradiation, diathermia etc.

There are many interesting articles from other Philadelphia clinics. In addition to these there are many excellent chapters from various special clinics. The Symposium on Fractures by Dr. Eliason and associates is very well done and gives a bird's eye view of an extensive experience in the treatment of fractures of the long bones; with a resume of incidence, type of treatment, length of stay in the hospital, length of disability, end-results etc.

The volume is well balanced, well illustrated and will be extremely valuable to the general surgeon.

Applied Biochemistry. By WITHROW MORSE, Ph.D., Professor of Physiological Chemistry and Toxicology, Jefferson Medical College, Philadephia. 958 pages. Illustrated. W. B. Saunders Co., 1925. Cloth $7.00.

In this book of 958 pages Prof. Morse has combined a tremendous amount of information. He has tried to stimulate enthusiasm about scientific knowledge and about scientists by inserting pictures of those who are largely advancing the bio-chemical problems of the day. He introduces the student in an interesting way to these personalities, making them something more than a mere name. He has also introduced in many places interesting biological facts and analogies which stimulate the reader to think.

The book starts with a discussion of the reactions of man to his environment and of the important constituents of his body. The enzymes and their modes of action are next discussed. Then follow long chapters on the chemical nature of the various foodstuffs followed by a chapter on digestion absorption and intermediary food metabolism. The endocrines as they influence metabolism are next discussed. The excretion of catabolites and the methods of analysis of blood and excreta complete the book.

It is a very difficult problem to combine theoretical bio-chemistry of the day with its practical applications, but this had been on the whole extremely well done, and the facts are not only placed in a quite satisfactory order, but are also very interestingly presented. This is a very superior book and one which is sure to be of great value to all students of the problem. It is recommended highly. Its value will largely be for undergraduates but graduate students will probably benefit from it as well.

A Classification of the Tumors of the Glioma Group On A Histogenetic Basis With a Correlated Study of Prognosis. By PERCIVAL BAILEY and HARVEY CUSHING. Philadelphia, London and Montreal: J. B. Lippincott Co. 175 pages.

"Tumors of the Glioma Group" by Bailey and Cushing is the brief report of an analytical microscopic and clinical study of the material and records of over four hundred "verified gliomas". Forming, as they do, about forty per cent of all intracranial neoplasms, the "gliomas" offer an unrivalled field for such an investigation. This is particularly true when we take into consideration the conflicting histologic and prognostic attributes of this group, with the resulting confusion in the minds of all concerned with its treatment.

In an endeavor to bring order out of this chaos the authors have taken as their diagnostic foundation the embriologic histology of the central nervous system. The first chapter presents this difficult subject in a singularly clear manner. In this way a developmental cellular classification is provided upon which the more complicated tumor tabulation is based.

The tissues from two hundred and fifty-four of the four hundred and fourteen gliomas in the series up to January 1924 serve as the material for this study. These tumor tissues were

re-examined and subdivided into thirteen groups. As a result, "It has been found, as might have been anticipated that the tumors whose cells reproduced the structure of the less differentiated cells in the developing central nervous system, are more actively growing than are the ones composed of more highly differentiated cells". Clinically, the increasing degree of differentiation of the tumor cells carries with it in direct ratio an increasingly lengthened survival period.

The reader cannot help but be impressed with the logical presentation, the studied avoidance of all extreme claims and withal the justness of the conclusions arrived at. Co-ordination of the clinical with the histo-pathological aspect of the material serves to re-emphasize the value of these conclusions and points the way to a re-adaptation of our methods of treatment so as to better meet the needs of the individual case.

This volume opens the door to further work in this important field and at the same time will serve as an authoritative starting point and most potent stimulus to all future investigators along this line.

The Proceedings of the Charaka Club. Volume 6, pages 145. New York, Paul B. Hoeber, 1925.

The sixth volume of the Proceedings of the Charaka Club contains a number of papers of special interest to physicians and medical historians. Dr. B. Sachs and Dr. Lewis S. Pilcher contribute two short papers on the late Dr. Arpad G. Gerster, who was formerly a member of the Charaka Club. Dr. Frank S. Meara writes two papers, one on Demokedes of Kroton (6th century B. C.), the other on "John Baskerville and the Baskerville Press." Both contributions contain a large amount of accurate information and are of distinct value to the medical historian. Dr. George L. Walton gives us three papers, all of which are amusing. In addition one of his papers on "How to Tell a Druid from a Dryad" contains an excellent summary of our knowledge of the Druids and their stone temples in England. A number of shorter notes complete the volume. The Proceedings of this Club are always of interest. One regrets that the first two volumes are now out of print and cannot be obtained except at a very high price.

Essentials of Prescription Writing. By CARY EGGLESTON, M.D. Third Edition. Philadelphia and London. W. B. Saunders Co.

The third edition of this book has certain changes that are of definite value, the most important being:

Fuller explanation of the use of Latin grammar in prescription writing, and the addition of practice prescriptions in order to give a wider variety of prescription types. It is a valuable book for medical students particularly, and should be a source of much useful information for the recent graduate in medicine. The section in narcotics with specific directions how to avoid complications with the Internal Revenue Department is of very definite value.

Betterman II on the Business of Medicine. By CHARLES ELTON BLANCHARD, M.D. 8°, p. 249. Medical Success Press, Youngstown, Ohio, 1926.

Dr. Blanchard's essay takes up the economic side of medicine. He approaches the subject, however, with a chip on his shoulder. For him, the "noble profession" has turned out to be a sordid fee-getting business. He would remedy this evil, apparently better known in the Middle West than on the Atlantic seaboard, by a National Health Department, government charter and supervision of medical schools, full-time physicians paid by public funds and similar measures. In other words, the book is an appeal for State medicine.

Few will agree with Dr. Blanchard's conclusions. He has stated his case fairly, however, although his style of presentation will hardly help his cause. Such a book cannot be strongly recommended to a serious student of medical economics and the reviewer cannot see how the author could have any other purpose in writing his book than as an appeal to the more thoughtful of our profession.

Pharmacopoeia of the United States of America, Tenth Decennial Revision. Prepared by the Committee of Revision and Published by the Board of Trustees. Official from January 1, 1926. J. P. Lippincott Company, Agent.

The Tenth Decennial Revision of the United States Pharmacopoeia became official on January 1, 1926. The present edition of this publication, the first issue of which was published in 1820, was authorized at a meeting of the United States Pharmacopoeial Convention on May 11, 1920. An outline of the organization of the United States Pharmacopoeial Convention and a list of the officers of the convention and the committees and auxiliary staff who assisted in the revision are given in the opening pages of the book. The greater part of the volume is taken up with monographs on the preparations listed as official. For each preparation are given its synonyms, chemical formula when known, description and physical properties, test for identity, tests for purity, method of preserving, and common form in which it is employed. The average adult dose follows. The second part of the book deals with general tests, processes and apparatus. There are tables of atomic weights, acid and alkali tables, and other information for chemists.

The Medical Department of the United States Army in the World War. Vol. VIII. Field Operations. Prepared under the direction of MAJ. GEN. M. W. IRELAND, the Surgeon General, by COL. CHARLES LYNCH, M. C., COL. JOSEPH H. FORD, M. C., LIEUT. COL. FRANK W. WEED, M. C. Copies may be procured from Supt. of Documents, Govt. Printing Office at $3.00 per copy.

The attention of all medical men who served overseas, and of those now in the Medical Reserve Corps, is directed to the above publication. It is a substantial volume of 1076 pages, devoted to a discussion of the activities of the Medical Department in the major operations of the American Expeditionary Forces. Section I gives a general view of the Medical Department organization; Section II, American Division with French Armies; Section III, The St. Mihiel Operation; Section IV, Meuse-Argonne Operation. Other sections give the more scattered operations, such as those in Germany, Italy, North Russia and Siberia. In each section are shown many maps giving the progress of the troops involved, while the text describes briefly the military movements and, at greater length, the coincident medical activities. The book is practically a history of the war, so far as the American Expeditionary Forces were concerned. It is illustrated by numerous photographs of locations and army hospitals. To anyone interested in our European adventure, it is a document worth having.

Sixty Years in Medical Harness or the Story of a Long Medical Life 1865-1925, by CHARLES BENEULYN JOHNSON, M.D. 8°, p. 333. New York, Medical Life Press, 1926.

The book is volume 1 of the library of Medical History, edited by Victor Robinson, M.D. Dr. Johnson's autobiography covers a long period of time, from his services as a hospital steward in the Civil War to his present position as a retired physician in Champaign, Illinois. As a young man he attended lectures at the Medical Department, University of Michigan (1866-7) under Moses Gunn and Alonzo B. Palmer; the next year, at the Chicago Medical College under Nathan Smith Davis. Not being able to continue for financial reasons, he taught school for a year in rural Illinois and attended the Saint Louis Medical College in 1868.

Then came the great adventure, looking for a place to practice, the story of which is the most interesting part of Dr. Johnson's book. He set off on horseback, stopping here and there to inquire, until he reached Chatham, Illinois, a small town near Springfield, where he "located", largely because there was no other doctor there. He painted his own sign and hung it out in front of one of the village drug-stores, where he had his office in the rear of the building. For two years he kept at it and then went to Cincinnati, where he finally, after another winter's work, got his degree from the Ohio Medical College in 1872. He went back to practice on the prairie, married in 1874, became interested in his county, and later in his state medical society, and in 1879 moved to Champaign where his children could have better educational advantages. In passing, it ought to be noted that all six of his children later graduated from the University of Illinois. He did general practice, traveling for miles through the black loam of the Illinois corn belt, and was a pioneer in the work of the Illinois State Board of Health. His three important papers were personal observations of epidemics of diphtheria, typhoid and influenza.

All his story is told in an interesting and modest manner. The chapters on "Medicine in 1868" and "Medicine in the Eighties and Nineties" give an excellent summary of American medical thought during those periods. The book ought to interest many as a simple story of a sound country doctor, who held high ideals in medicine, and made of himself a valuable citizen of his State. Although much of the book may be of local interest only, there are chapters which ought to appeal to a wide audience.

Neuritis and Neuralgia. By WILFRED HARRIS. 8°. p. 418. Humphrey Milford, Oxford University Press, 1926.

No one is better qualified to write a book on neuritis and allied conditions than Dr. Wilfred Harris of London, who has devoted many years of study to the subject. In this volume he fully justifies our confidence in him and his work, for a more complete, scholarly and valuable book on the subject than the one he has written is not to be found in medical literature. He has covered the field in all its aspects and has touched on many of the borderline diseases, such as the vasomotor disorders, neuro-fibrositis, migraine and the psychalgias.

One finds, of course, excellent descriptions of the well-known forms of neuritis and neuralgia, like Bell's palsy and trigeminal neuralgia, but in what other book would you expect to find an excellent description of haematoporphyrinuric polyneuritis or glossopharyngeal neuralgia? The book is also authoritative in the matter of treatment. Dr. Harris' own method of deep alcoholic injections for neuralgias is fully described.

A book such as Dr. Harris has written is not difficult to valuate. No publication covering a similar field compares with it in thoroughness or completeness. It can be most highly recommended to both the general practitioner and the specialist as a very valuable, and almost indispensable, addition to their library.

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ARTHUR W. ALLEN, M.D.
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JAMES B. AYER, M.D.
GEORGE H. BIGELOW, M.D.
ARLIE V. BOCK, M.D.
WALTER P. BOWERS, M.D.
LAURENCE D. CHAPIN, M.D.
AUSTIN W. CHEEVER, M.D.
ROBERT CHENEY, M.D.
EDWARD D. CHURCHILL, M.D.
ISADOR H. CORIAT, M.D.
BRONSON CROTHERS, M.D.
JOSEPH GARLAND, M.D.
HORACE GRAY, M.D.
ROBERT M. GREEN, M.D.
JOHN B. HAWES, 2ND, M.D.
WILLIAM A. HINTON, M.D.
GEORGE W. HOLMES, M.D.
FRED S. HOPKINS, M.D.
MISS SALLY JOHNSON
FRANK H. LAHEY, M.D.
SAMUEL A. LEVINE, M.D.
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PHILIP D. WILSON, M.D.

PROGRESS REPORTERS

AUSTIN W. CHEEVER, M.D.
ISADOR H. CORIAT, M.D.
ROBERT L. DENORMANDIE, M.D.
JOHN B. HAWES, 2ND, M.D.
HERBERT H. HOWARD, M.D.
JOHN LOVETT MORSE, M.D.
ABRAHAM MYERSON, M.D.
FRANK A. PEMBERTON, M.D.
PERCY G. STILES, PH.D.
HARVEY P. TOWLE, M.D.

KEY TO ABBREVIATIONS

Ad.—Address.
B. R.—Book Review.
C. C. R.—Cabot Case Record.
C.—Correspondence.
E.—Editorial.
L. N.—Legislative Notes.
M.—Meetings.
M. M. S.—Massachusetts Medical Society.
Misc.—Miscellany.
M. H.—Medical History.
M. P.—Medical Progress.
N.—Notice.
N. E. H. A.—New England Hospital Association.
N. E. P. S.—New England Pediatric Society.
N. E. S. S.—New England Surgical Society.
N. E. U. A.—New England Urological Association.
N. I.—News Item.
O.—Obituary.
Or.—Original Article.